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Volume XII. JULY, 1928 No. 7

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EL PASO COUNTY (TEXAS) MEDICAL SOCIETY
THE MEDICAL AND SURGICAL ASSOCIATION
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## THE VALUE OF THE LABORATORY TO THE CLINICIAN

F. G. SCHAIBLE, M. D.,
Tucson, Ariz.

(Read at the thirty-seventh annual meeting of the Arizona State Medical Association, held at Tucson, April 19-21, 1928.)

Pathology, in its broader meaning, being the basis of scientific medicine, it is indeed appropriate that this meeting should open with a paper on laboratory work in its relation to and as an aid to the clinician in diagnosis. Accuracy in diagnosis, as pointed out by pathologists who have an opportunity to compare the clinical diagnosis with autopsy findings, has failed in a great measure; therefore, any information by those striving to be exact should not be overlooked. The clinician, best able to interpret symptoms and physical signs, when he thinks it necessary to make a laboratory search to substantiate his findings, should call on the laboratory as an aid. This presupposes, on the part of the pathologist a knowledge of the materials to be examined and the methods of interpreting the results by the clinician.

The materials that may be submitted for examination are the following: Blood, spinal fluid, transudates and exudates, gastric contents, feces, urine, sputum, surgical tissues.

### BLOOD.

Blood, the fluid tissue of the body, is divided for examination purposes under the following headings:

Cytology: It is unnecessary for our purpose to discuss the ancestral cell of the group of blood cells. Suffice it to say that as to their histogenesis, they are produced by the bone marrow, spleen and lymph glands and that we have an erythroblastic and leucoblastic hyperplasia or metaplasia, according to the stimulus. For example, any agent as a hemolysin which decimates a large proportion of red blood cells makes the blood forming organs hyperplastic, both erythroblastic and leucoblastic. These changes, however, are not always manifest in the peripheral circulation. In infection and toxemia due to chemotactic influence, we have a leucocytosis resultant. Therefore, to learn the disease condition of the blood, it becomes necessary to enumerate the red blood cells, white cells and blood platelets in a cubic millimeter of peripheral blood, to note the percentage of hemoglobin, and the morphological (regenerative and degenerative) changes, as well as the staining affinity of the blood cells. These determinations tell us whether anemia or leucocytosis pertains and the clinician, knowing the symptomatology can in most instances classify the type of anemia and whether or not the leucocytosis be temporary or permanent. Routinely, it is important to examine the blood because any symptom complex may be due to or associated with a disease of the blood. The assertion that pernicious anemia occurs with more constancy in certain locations is not so in fact but is due to the ability of the men in these places to better recognize the disease. In the comparatively short time that I have been here we have noted two cases of lymphoid leukopenia; both were unrecognized clinically. Another condition which we have had to deal with recently, is agranulocytic angina. This disease is manifested clinically by sudden onset, chill, sore throat, high temperature and bad prognosis. It is an infection of the throat which produces a toxic condition of the bone marrow, a marked leukopenia, a disappearance from the blood of all the polymorphonuclear neutrophiles and a severe anemia. One case showed a leucocyte count of 400 white cells per cubic millimeter of blood with a mononucleosis of which ninety-six per cent were lymphocytes.

Parasitology of the Blood. For malarial protozoa, the intra-corporeal cycle is best studied in fresh specimens. When this is not possible, stained specimens may be used. In intermittent fever, the therapeutic test with quinine should not be made unless it is impossible to make a satisfactory blood examination. In giving quinine, the parasites cannot be found in the circulating blood; hence, diagnosis remains un-

certain and the patient is likely to be subjected to a long course of unnecessary treatment. In trypanosomiasis (sleeping sickness), the trypanosomes can be demonstrated in the wet preparation. exhibiting a slow spiral movement. They are found free in the plasma but may also be seen in the interior of leucocytes. Dry smears may be stained and the parasites found as in the staining of malaria. In relapsing fever, the spirochete of Obermeier can be shown in the fresh and stained films. These spirochetes in the fresh specimen have a wriggling movement which agitates the cells of the blood.

In kala azar (Protozoa Leishmanio Duovani), the parasites are seldom found in the peripheral blood, and only when the temperature is high. Splenic puncture gives the best results. The organisms are chiefly found in the large mononuclear cells.

In filariasis we find the microfilaria (embryo) in the circulating blood in large numbers during the night, almost disappearing during the day; they invade the lymph vessels, producing lymphangitis, especially of the scrotum and legs (elephantiasis).

In trichinosis. Embryos of trichina may appear in the blood stream about the twenty-third day after infection; this, together with a marked hypereosinophilia, renders a positive diagnosis.

In trichinosis, embryos of trichina may found in the portal system through which they invade the urogenital system; diagnosis is made usually by finding the ova in the urine.

Bacteriology: Blood cultures in typhoid and paratyphoid are positive during the first week of the disease, the Widal being rely positive before the end of first week and may be delayed until the third week. In septicemia, various bacteria may be found in the blood; for example, streptococcus, pneumococcus, colon bacillus, less frequently gonococcus, meningococcus, bacillus of anthrax, gas bacilli and bacillus pyocyaneus, streptococcus putridus in septic abortion, rarely, the diphtheria or influenza bacillus, bacillus proteus, bacillus fecales, alkaligines or micrococcus tetragenus.

Serum Reactions: Agglutination reactions in typhoid and paratyphoid begin usually by the end of the second week, may be delayed until the third week and persist for months after infection. Other serum tests of value are Weil Felix agglutination in typhus (proteus bacillus 1-25-200); complement fixation in tuberculosis and syphilis, gonorrheal fixation in complicated gonorrhea to diagnose latent foci of infection. In syphilis, a positive Wassermann reaction tells of the presence in the blood or spinal fluid of certain defensive bodies repallida. It may occur as soon as primary sore is recognized, but more often occurs during the development of the secondary symptoms about six to eight weeks after infection. Negative reactions at times occur when recognizable active lesions are present; this is probably due to the inability of the cells of the body to manufacture the detectable bodies or to the ingestion of alcohol or effect of antiluetic treatment. Yaws, a disease related biologically to syphilis, but distinctive in etiology, pathology and clinical manifestations, gives, after a long continued infection, a cross protection to a certain extent against syphilis. Yaws gives a positive Wassermann reaction during the early stage, which remains positive in the latent period. Other conditions in which positive fixation has been said to have occurred are leprosy, tuberculosis, scarlet fever and psoriasis. Excluding technical errors, it is safe to say that they were complicated by syphilis; i. e., if the fixation was complete and not due to anticomplementary substances which may occur normally in sera and give partial or incomplete fixation. The Wassermann reaction is a complicated biological reaction based on the phenomenon of complement fixation, the true nature of which is still undetermined; i. e., whether it is a physical, chemical or physico-chemical process. Substitutes for the Wassermann such as the precipitation tests, as described by Meinecke, Sachs, Georgi, and Kahn, are unreliable and are of value only as confirmatory when used in conjunction with the Wassermann reaction.

Blood Chemistry: Since methods have been devised to determine the chemical composition of blood, valuable information has resulted in constitutional diseases as diabetes, gout and nephritis. The older examinations of the blood, cited above, as cytological, bacteriological and serological, gave little information in these metabolic diseases. The time of taking the blood is in the morning before breakfast; that is, after a fourteen-hour fast and before any fluid or food has been taken. Take the specimen of blood by venipuncture in a bottle with capacity for 15 c. c. blood, into which three drops of a twenty per cent solution of potassium oxalate has been placed.

Renal diabetes (renal glycosuria), a relatively rare condition, may be differentiated from diabetes mellitus by the constancy of the glycosuria independent of the carbohydrate intake, the normal quality of the variation of the blood sugar, and the absence of diabetic symptoms. Here the point of

entrance of sugar excretion is below the level of normal blood sugar.

In diabetes mellitus, when the blood sugar is slightly increased above 0.17 per cent, a glycosuria is present, except in advanced cases showing nephritis, when the blood sugar may be 0.3 per cent without the appearance of sugar in the urine. Extended medical or surgical treatment should not be attempted on a severe diabetic without a knowledge of the blood sugar and the alkali reserve as indicated by the carbon dioxide of the blood. Insulin not only regulates carbohydrate metabolism, but indirectly has an influence upon fat metabolism and acidosis. Without the oxidation of a certain amount of carbohydrate, there is an incomplete oxidation of fat, giving rise to the ketone bodies which, in turn, produce an acidosis.

In gout, the uric acid is considerably increased, which makes this fact of importance in differentiating it from arthritis in which the uric acid is normal.

Essential hypertonia, is so diagnosed at times, but when the chemical changes in the blood are known, high uric acid, urea nitrogen and creatinin, the condition is shown to be a nephritis, arteriosclerotic in type.

In differentiating apoplexy and uremia, negative blood findings exclude uremia.

In eclampsia, nonprotein nitrogen is high normal or definitely increased, uric acid is high, urea nitrogen normal or subnormal; considering these findings, true eclampsia shows only slight renal involvement.

In urology, preoperative information of the chemistry of the blood in all surgical conditions of the kidneys, bladder and prostate is required. Patients presenting urea nitrogen over 25 mg. should be operated with caution and best after treatment to relieve the nitrogen retention. If the urea nitrogen is under 20 mg. per 100 c. c. of blood, these patients may be considered good operative risks insofar as their kidneys are concerned.

In intestinal obstruction, there is high nonprotein nitrogen and urea nitrogen.

In general peritonitis, as after rupture of the appendix, if blood urea is markedly elevated, prognosis is poor.

In nephritis, uric acid is high, an earlier diagnostic sign than albumen, urea and cylindruria urea nitrogen and creatinin are increased.

Creatinin is slightly increased in syphilis, certain heart conditions, advanced diabetes, with high figures often in advanced nephritis. Those showing five milligrams or over show little improvement and die in a comparatively short time.

Calcium is decreased in tetany and advanced nephritis.

METABOLISM

The sum of all the physical and chemical processes by which living organized substance is produced and maintained and, also the transformation by which energy is made available for the use of the organism. Amounts and degrees of these processes may be derived in many ways, such as control of food, chemical examination of excretory products, or thermal changes. At a very early date, clinicians began to study the gaseous exchanges in disease but the methods were so crude and the normal processes so imperfectly studied that the results of this labor amounted to little. From these early experiments, however, have been derived our present day metabolic apparatus, some of which measure the amount of oxygen consumed, others the amount of carbon dioxide. Both methods determine the calories of potential heat which is the unit of energy desired. Since we know from chemical and physical experiments the composition of most foods, a great number of our present day diseases can be controlled by diet. The sum total of metabolic tests are to aid the clinician in his diagnosis and watch the progress, giving the deviation from normals.

The metabolic rate has as variable factors, temperature, barometric pressure, surface area, sex and age. Knowing what these factors are, experiments have fixed definite metabolic rates for certain fixed conditions. Using these as standards, changes brought about by disease can be noted.

Many conditions change the metabolism from normal to plus or minus. Under-nutrition gives a striking reduction.

Diabetes gives low reading from plus 2 to minus 18 average, one case cited by Harris and Benedict gave minus 50. Thyroid diseases give decided changes in metabolic rate, ranging from plus 20 or higher, in exophthalmic goiter, to minus 20 or below in myxedema, hypothyroidism and malignant thyroid.

Other outstanding diseases showing variations in metabolic rate are dysphagia, minus 20 to plus 15; Addisons, minus 20 to plus 15; arthritis, minus 20 to plus 15; anemia, minus 20 to plus 15; diabetes insipidus ranges in the positive zone; Hodgkin's disease, one hundred per cent above plus 20; polycythemia, fifty per cent above plus 20; ductless glands, eighty-seven per cent above plus 20; encephalitis, twenty per cent above plus 20.

TRANSUDATES AND EXUDATES

These are fluids which appear in the tis-

sues and cavities of the body. Transudates are noninflammatory in origin, exudates resulting from inflammation. Since transudates are not inflammatory in origin, they are rather clear, light yellow or have a greenish opalescence. Exudates may be serous, serofibrinous, purulent, putrid or hemorrhagic. Chemically, the amount of albumin is greater in exudates and we have a cellular reaction depending upon the nature of the infecting organisms.

### GASTRIC ANALYSES

Analysis of the stomach content of late has fallen into some disrepute. The results are influenced by many intra and extra gastric factors and can be interpreted only in the light of the clinical findings.

### FECES

Stool should be passed in a clean vessel without the admixture of urine. In examination for amebae, the stool should be kept warm and examined in this condition. Pathologically, we may find increased amounts of normal constituents, blood, pathogenic bacteria, animal parasites and their ova and biliary and intestinal concretions. If a search for amebae is desired, no disinfectant should be added to the stool.

### URINE

The routine examination of urine is familiar to all. Suffice it to say, that no quantitative determination should be made unless a sample of a mixed twenty-four hour urine be used. Instruct patient to collect urine for twenty-four hours in a clean vessel, kept in a cool place, mix it well, measure the quantity and bring eight or more ounces to the laboratory.

### SPUTUM

When collecting the sample for examination, the morning sputum, or the whole amount for twenty-four hours, should be saved. Have the patient rinse the mouth well to avoid contamination by food stuffs. Early morning specimen coughed from the lung or bronchi is preferable. Sputa should be examined microscopically in the fresh and stained preparation. Concentration of the sputum is often advisable.

### CEREBRO SPINAL FLUID

Normally, the spinal fluid is clear and practically void of cellular elements, and is best collected in three sterile test tubes. In disease, the fluid may be cloudy, or dull red or brown in color, seen in hemorrhagic conditions. In compression of the cord by a tumor, the fluid presents Froin's syndrome; namely, a clear yellow color, rapid and marked coagulation, large amounts of globulin and no blood pigments by chemical tests. Abnormal amounts of globulin; i.e., increase, occur in acute infections, in tuberculous meningitis and in syphilitic and parasyphilitic affections. In the acute infections where a polynucleosis is present, the normal reducing substance is absent, though present in the chronic types of infections. Cytology; in the acute infection, there is a polyneucleosis, in chronic infection, a mononeucleosis. The Wassermann test is applied to the spinal fluid using larger quantities than used in the examination of blood serum. In syphilis of the nervous system, general paralysis of the insane, and tabes dorsalis, Lange's gold test will give reduction in the left of the series; i. e., in low dilutions. In tuberculous meningitis reduction occurs in the middle, and the acute purulent forms of meningitis in the right of the series; i. e.., the high dilutions.

### SMEARS, CULTURES AND ANIMAL INOCULATION

These are made to determine the exciting organism present.

Many other laboratory tests, too numerous to mention, may be of value to the clinician. Among them are smears for the morphology and staining reaction of organisms. This pertains only to smears from venereal lesions. Smears taken from other portions of the body should always be accompanied by cultures, because often we have two organisms working symbiotically. For example,, direct smears from a lesion in the mouth may show fusiform bacilli and spirilla of Vincent, and the cultures show diphtheria bacilli, which always makes the diphtheria more virulent. There are a number of skin tests used to determine certain conditions of the body tissues and cells. The Schick test is used to determine whether or not immunity to diphtheria exists. Skin tests are used to determine local allergic reactions, by the application on, or injection into the skin or mucous membranes, of the sensitenogen, in individuals hypersensitive to foods, pollens, bacteria and drugs, as well as to horse serum, and to the proteins of the skin and hair of the horse and other animals and the feathers of fowls.

### EXAMINATION OF TISSUES

Tissues removed at the time of biopsy or surgical operation should be placed in a fixative solution, carefully labeled and with a slip attached giving as much information as possible pertaining to the case. This is of extreme value to the pathologist.

His interpretation of the morphology of the cells present is only his opinion. Whether the cells are of inflammatory origin or

new growth, malignant or non-malignant, is based on his experiences of a vast surgical material. Many times, men equally experienced will disagree on a tissue, some maintaining the cells are of one type, others of another type. The borderline between malignancy and non-malignancy is a small one in many instances.

Concluding, I would say that positive laboratory findings should be considered as a symptom, not as a diagnosis, and that cooperation between the clinician and the laboratory worker assures progress.

DISCUSSION

DR. W. WARNER WATKINS, Phoenix, Ariz.—This is a very excellent resume of the chief fields of medicine in which the laboratory can be of aid to the clinician. The point which still needs to be emphasized is that the pathologist must be used as a consultant by the clinician, if laboratory aids are to render their full possibilities. The clinician who endeavors to decide for himself just what kinds of laboratory examinations he will ask for will never realize the full value of this field of medicine. If he calls the pathologist into consultation, lays the problems before him and then allows the pathologist to decide what laboratory examinations are indicated, will find that the clinical laboratory has possibilities he never dreamed of.

In our community so simple a thing as a differential count along with the total white count has had to be forced on the attention of our clinicians by our assuming to make the differential as a routine, whether asked for or not. The same thing is now being done with the Kahn test; we are not waiting for the clinician to learn of the value of this adjunct to the Wassermann, but are doing it as a routine. There are many problems in clinical medicine, in which the laboratory may hold some valuable aids, as yet unknown to the clinician, and which will only come to light when the pathologist has opportunity, as a consultant, to suggest them in individual cases.

## ENDOTHELIOMA INVOLVING WALDEYER'S RING

JOHN J. McLOONE, M. D.
HARLAN P. MILLS, M. D.
Phoenix, Arizona.

Read before the thirty-seventh annual meeting of the Arizona State Medical Association held at Tucson, Ariz., April 19-21, 1928.

An endothelioma is a new growth which is believed to originate from the lining cells of blood and lymph vessels and spaces, subdural and serous surfaces. The question of the importance of this group of tumors has had much dicussion by pathologists; some place a very restricted class under this head; others describe a numerous and complex group as endothelioma. This difficulty arises no doubt largely from the variety of cell forms encountered, as well as their arrangement. This variation apparently arises from the peculiar embryological source of their endothelial cell.

It is beyond the scope of this paper to discuss this question except to say that it is fairly well established that the lining cells of the great body cavities arise from cells lining the primitive body cavity, which forms by a splitting of the two layers of mesoderm. The lining cells of the blood and lymph cells and subdural spaces arise from mesenchymal cells and are closely related to connective tissue. Not only the embryology, but also the physiology of endothelial cells places them in a position intermediate between epithelium and connective tissue.

As an example of the variety of their functional activity we might mention their secretory action, their metabolic activity, as well as their power to proliferate and engage in phagocytosis. It has also been suggested that they are the source of some of the large mononuclear cells of the blood.

Illustrating the proliferative capacity of endothelial cells attention might be directed to the changes in inflammation, which contribute largely to the new cells in the intima of vessels involved in syphilitic and tuberculous endarteritis, and also the epitheloid cells in tubercles. In exudates and thrombi they act not only as phagocytes but also as proliferating agents, which promote new vessel formation and organization. This proliferation may proceed to definite tumor formation, inasmuch as endothelioma have been described as arising in an organized thrombus in a vein. In lymphoid structures, marked endothelial proliferation may be seen, as in tuberculous lymphadenitis an entire node may be practically replaced by this cellular structure.

In view of the behavior of endothelium under physiological and pathological conditions, and in view of the distribution of endothelium in every tissue of the body, the possible wide extent of endothelial tumors is evident.

The classification of endotheliomata into definite types has been difficult and unsatisfactory because of the wide variation both in cell forms and arrangement, certain tumors closely resembling connective tissue new growths, while others so closely resemble epitheliomata that pathologists of wide experience differ as to the histological diagnosis.

The growth may assume a perivascular, or column-like formation, or resemble adenomatous alveoli, while other types present a diffuse growth without any definite arrangement.

Endothelioma can originate from any type of endothelium, but it is probable that the endothelium of lymph vessels and lymph spaces is the most common source.

This new growth extends by invading adjacent structures, or by widespread lym-

phatic metastases but is relatively less malignant than carcinoma or sarcoma.

### CASE REPORT

E. T., male, white child, age two and a half years. Referred by Dr. A. A. Shelley on March 27, 1927.

**History:** Information was elicited from parents that the child had not breathed naturally since infancy. About six weeks previously he began to have some difficulty in swallowing solid food. Parents stated that patient might have ingested some preparation which contained lye.

**Examination:** Child was poorly developed and extremely undernourished. There was some cough with a moderate amount of dypsnea. The submaxillary glands on both sides were somewhat enlarged. Inspection of throat revealed a soft friable mass of tissue, occupying right tonsillar fossa. The same condition prevailed on the left side, but involved only the lower portion of tonsillar region. On account of the swelling of the tongue, especially toward the base, further inspection by the indirect method was not feasible. Parents were advised to return with child on the following morning in order that a more satisfactory examination might be made by the direct method.

These instructions were not followed. The child was not brought back until April 9th, when an endoscopic examination was made. All of the symptoms noted on first visit were then much intensified. There was a definite laryngeal stridor, and the little patient was barely able to swallow liquids.

Direct inspection with laryngoscopic tube showed an extensive mass of necrotic tissue at the base of tongue. This extended upwards and involved all of the right and the lower portion of the left tonsillar fossa, thus including the greater portion of Waldeyer's ring. In the right tonsillar region, the neoplasm assumed a sessile-like appearance and protruded downwards into the right pyriform sinus, encroaching upon the inter-arytenoid space. The hemorrhagic and friable character of the growth necessitated its removal in sections. The neoplasm appeared to be partly fibrous, but essentially of degenerative lymphoid structure.

Pressure of the tumor at the base of tongue resulted in impaired motility of the epiglottis. This condition, together with the partial obstruction of the esophogeal opening, accounted for the difficulty in breathing and deglutition.

**Pathological Report:** The tissue specimen consists of several small rounded masses resembling lymphoid tissue. Microscopic sections show a new growth made up of rather large, faintly staining, atypical cells, arranged in small alveoli, with a slight amount of fibrous stroma. Vessels are quite abundant and in some instances show only the endothelial layer of the vessel wall. On one surface is shown a squamous epithelial layer, which is separated from the tumor cells by a fibro-vascular layer. The histological picture suggests a diagnosis of endothelioma, and doubtless malignant in character. (Mills).

Following operation the child showed some improvement in his general condition. His breathing became much easier, and he was able to swallow some solid food. On May 14th endoscopic examination showed no return of growth. Some tissue debris was observed in both tonsillar fossae and removed. There was a slight amount of scarring in the region of the arytenoids which extended to the right true cord. The epiglottis was of normal appearance. X-ray therapy was advised, but the parents preferred to postpone same.

The patient disappeared from observation until July 9th. Examination at that time showed growth to have partially returned at the base of tongue. Tonsillar regions were not involved. There was an intense glossitis which increased the difficulty of respiration and swallowing. A diffuse enlargement was present in submaxillary regions with obliteration of glandular outline. On July 11th the dypsnea had become so aggravated as to necessitate a low tracheotomy. This was done under local anesthesia. Following tracheotomy the child showed marked improvement in his breathing.

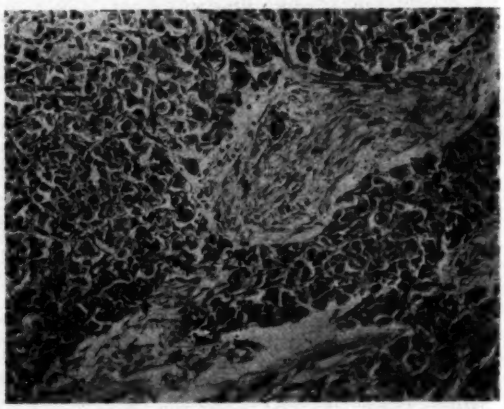

Fig. 1. Photomicrograph showing stroma and larger alveolar groups of cells separated by fibrous framework. Hematoxylin and eosin stain, magnification 500x. (Major Callender.)

Fig. 2. Photomicrograph of section with silver impregnation of reticulum showing arrangements of cells in minute alveoli. Magnification same as Fig. 1. (Major Callender.)

Two days after admission to hospital some necrotic tissue, about half the size of a walnut, was removed endoscopically from the base of the tongue and the left pyriform sinus. This resulted in a recession of the glossitis and enabled the patient to swallow more easily.

The swelling in submaxillary regions diminished somewhat. The child's condition during stay in hospital, which lasted ten days, showed the ben-

eficial effects of careful nursing and improved hygienic surroundings.

Following his return home, the child's condition continued about the same until August 1st, when he became gradually worse. X-ray therapy had been instituted but later discontinued.

Examination on August 15th disclosed a few areas of new growth in both tonsillar regions Patient expectorated foul-smelling pus mixed with blood. On August 26th there was an extension of neoplasm to soft palate and also a recurrence of growth at base of tongue. On account of previous tracheotomy child's breathing was not obstructed. However, there was great difficulty in swallowing even liquids. Section of tissue showed it to have undergone necrosis with degenerative changes that obliterated all cell outline. The growth had now completely invaded, probably by direct extension, the sublingual and submaxillary areas, resulting in extensive swelling. Adjacent regions of the neck had also become involved. Child died on September 11th. No autopsy could be obtained.

Sections and gross materfial were submitted to Major George R. Callender of the U. S. A. Medical Museum whose first opinion was that the tumor was epithelial in character, but after further study thought it should be classified as an endothelioma. However, he included the specimen in Registry of Lymphatic Tumors for circulation among other pathologists and obtained opinions, some considering it as epithelioma and others as endothelioma.

Two other pathologists of national reputation studied the slides, one declining to express an opinion, the other considering it as an endothelioma.

## DISCUSSION

DR. CLARENCE E. IDE, Tucson, (opening). This example of a rare tumor presents unusual interest and Drs. McLoone and Mills deserve our gratitude for working it up and presenting it to us.

It has been stated repeatedly by medical writers that the mode of production of endothelioma is as yet undetermined. One meets this statement everywhere throughout the literature of the subject. Yet, as the doctors have stated the condition is believed to arise primarily in the endothelium of the lymph vessels, sometimes of the blood vessels, occasionally in the dura and such serous surfaces as the pleura. So great an authority as Ewing states, in discussing the origin of this class of tumors, that there are a few well worked out cases in the literature showing the origin of endothelioma in the lining of lymph vessels but that otherwise the case is not yet proven. At any rate this growth is said to be malignant in character and evidence of this will be seen in figures of mortality and recurrence. Entire removal of many of these growths is difficult because of their poor differentiation from their environment. Frequently high vascularity makes attempt at separation a very hemorrhagic procedure. An exception to this statement occurs in the case of the whorl cell endothelioma. These are essentially benign, encapsulated and grow slowly. Here we have a good operative risk.

Endotheliomas occur commonly as primary tumors of the lymph glands. In character of cell and mode of growth, many do not differ from endotheliomata arising from blood or lymph endotnelium in other structures of the body. Ewing has pointed out that the virus of Hodgkin's disease may pass rapidly into a neoplastic process resembling a lymphosarcoma. This is a Hodgkin's endothelial sarcoma. He recognizes three types; a diffuse, a plexiform or perivascular, and an alveolar. The growth is peculiar in that, with the exception of occasional visceral metastases, the spread is limited to lymphoid structures, in particular to the lymph glands. The cells show a lack of any marked invasive power. Oliver says that there is no sharp line between these endotheliomata and Hodgkin's disease or lymphosarcoma. Symptomatically these growths are not to be distinguished from those occurring in diseases of the Hodgkin's group.

Samuel Bradbury says that endothelioma of the lymph vessels spreads by way of the lymph channels, but is rarely as rapid in growth as carcinoma. In many cases, however, there is extension in the lymphatics far in advance of any visible sign of tumor, and for this reason endothelioma is noted for its persistent local recurrence.

F. Wise and H. J. Parkhurst state that endothelioma must be differentiated from chondroma, fibroma, osteoma, sarcoma and deep glandular carcinoma.

Endothelioma may be situated in any part of the mouth, the hard and soft palate being the site of predilection, with the floor of the mouth as second choice. Oval, ordinarily smooth, and of varying consistency, the tumor may be so large as to interfere with oral functions, as in the case under discussion. They grow slowly, the yellowish overlying mucosa is thin and may ulcerate if injured. Diagnosis is difficult, both clinically and histologically.

Endotheliomata of the nasopharynx are hopeless from a surgical point of view. It is to be noted that results after radiation are very disappointing. This growth also occurs in the cranial cavity. Some of these brain tumors undergo cystic degeneration, being filled with a yellow, gelatinous fluid. Evacuation of this fluid renews the activity of the cells, indicating a malignant character. In endothelioma of the brain there is osseous thickening of the skull sometimes, resulting from irritation of the periosteum, when the growth is in contact with the bone. This bone is ivory-like in character and operations on it should be approached with caution because of the shock resulting.

Meningeal endothelioma occurs especially at the cerebello-pontine angle. These, according to Keen, are often called fibrosarcoma. This refers us back to the statement in the paper that the living cells of lymph and blood vessels and subdural spaces arise from mesodermal cells and are closely related to connective tissue. They do harm by pressure rather than by infiltration, hence disturbances of function as of the cranial nerves which are often surrounded by the growth, subside after their removal. Solitary or multiple endotheliomata of the spinal cord occur, but are less common than in the brain, according to Keen.

Mandelbaum and Celler described a tumor of the thymus gland occurring in a case of myasthenia gravis, as an endothelioma.

This tumor occurs in the thyroid gland, arising from the endothelium of the intralobular capillaries. It forms cell cords and nests with marked proliceration of connective tissue. (Keen).

Alfred Stengel and Richard A. Kern are authority for the statement that melanotic endotheliomata arising in pigmented moles of the skin often metastasize to the liver.

M. A. Blankenhorn says that 40 or 50 cases of malignant disease of the pleura have been reported by Norris and Landis, largely endotheliomas. The possibility of mistaking these for chronic inflammatory processes may account for the rarity of reported cases. However, Patterson reported 96 cases all fatal. He states that metastases occur in the pleura of the contralateral side, lung, liver, kidney, peritoneum, spleen, adrenals,

heart, pericardium, brain and ovary. The patients survived only up to six months after diagnosis was made. This patient was first seen March 17, and died on Sept. 11, five and a half months.

Endothelioma of the pleura occurs as a diffuse thickening in the form of scattered nodules, sometimes associated with fluid, which, when present, is blood stained. The growth here is slow. The signs are those of pleural exudate. Sometimes there is temperature. (Keen). Richard Cabot says that leucocytosis is present as in a suppurative lesion, suggesting the necessity of care in studying obscure pleural lesions. When the growth is extensive the respiratory symptoms result from compression of the lung (Keen). It is stated emphatically that this tumor grows beyond relief before it is recognized. This undoubtedly explains Patterson's one hundred per cent mortality.

Endotheliomata in bone are often pulsatile and expansible, simulating aneurism. (Keen).

Schlessinger reported endothelioma of the rectum arising from the endothelium of dilated vessels of hemorrhoids.

MacCarty and McGrath diagnosed a tumor of the vermiform appendix as endothelioma instead of carcinoma because of the size and the lack of marked irregularity on the part of the nuclei of the cells of which the growth was composed, as well as the alveolar arrangement and staining qualities.

Attention has been called to the fact that raying is very disappointing in treating these growths; that endothelioma of the nasopharynx is hopeless from a surgical point of view; that removal from any site is difficult because of the poor differentiation of the tumor from its environment and high vascularity. As an obstructive lesion this one certainly demanded removal at the earliest possible moment. It would seem that removal by diathermy or electrocoagulation would offer more hope of a successful outcome than outright surgery, as the hemorrhage would thus be controlled and recurrences less likely. I think that we have been on the wrong track in the investigation of the treatment of malignant growths. It is being acknowledged by all that the disease is not a bacterial or parasitic one. Many are losing faith in the knife as it does not give a large enough percentage of recoveries. There is another line of treatment being investigated which may give the sufferer from malignant growth more hope and may stay the increase of deaths from malignancy. This treatment is chemical. There are those who apparently report good results from detoxicating and chemical treatment and it behooves us all not to despise any who can deliver the goods in the way of cure.

I further believe, with plenty of capable and scientific men that a cancer is not a local disease but a local manifestation of a general toxicosis, closely related in many ways with psoriasis, ichthyosis, eczema and other so-called skin diseases which are nothing but the manifestation in the skin of an effort of the body to throw off toxins.

DR. M. C. COMER, Tucson: This work is of particular interest to me because I have seen so few case reports of proven endothelioma of Waldeyer's ring. I wish to compliment the authors on the way they have worked this case up and feel they have contributed something valuable to the literature of this subject.

DR. J. J. McLOONE, (closing) I wish to thank the gentlemen for their discussion. The point brought out by Dr. Ide with regard to treatment is certainly pertinent. This case was practically hopeless from the beginning. Keeping the child alive and not allowing him to choke to death was the object of treatment. Undoubtedly electrocoagulation has its place in such cases, but if you could have seen the friable mass of this tumor which bled at the slightest touch, you would have hesitated to attack it. Even in the removal of a small portion for examination, it was absolutely necessary to watch the child carefully, because at one time he aspirated some of the growth and it had to be removed by the endoscope. These things were all thought of and in consultation with other men we thought the best thing was x-ray. The child did not come regularly for treatment, could not be held in position, and this treatment was not found practicable. The best we could do was the tracheotomy to prevent death from respiratory blocking, and removal of the growth which was against the esophagus so that the child could swallow and survive for a time. Life was prolonged and we felt that other treatment would not have saved the child's life.

## THE LIFE, GROWTH, AND REPRODUCTION OF BONE IN THEIR RELATION TO THE HEALING OF FRACTURES

W. L. BROWN, M. D., and C. P. BROWN, M. D,
El Paso, Texas

The elements concerned in the life, growth and reproduction of bone are:

1. The periosteum.
2. The cortex.
3. The Medulla.
4. The blood supply.
5. The epiphyseal lines.

We have carried out various experiments to determine whether or not periosteum is within itself osteogenetic. We have elevated strips of periosteum, left them attached at one end and turned them into the tissues without, in any case, having produced any bone of consequence. We have also taken free transplants of periosteum and put them into the muscles and subcutaneous tissues with negative results. We have found experimentally also, that young bones completely deprived of their periosteum will have a new fibrous membrane apparently identical to the periosteum within thirty days, and the bone will grow and keep pace perfectly with its fellow on the opposite side.

One very interesting experiment in relation to the osteogenetic function of the periosteum was as follows: We did a sub-periosteal resection of over an inch of the ulna in both bones of the same dog. In one, nothing further was done. This bone was completely reproduced three months later. In the opposite side the ends of the bone were capped with tinfoil to prevent outpouring of osteoblasts. If the periosteum restored the bone on the opposite side it should have done so on this side. But, instead, there was no restoration except where the osteoblasts were poured out around the bone caps.

In numerous experiments on the ribs we have found that a rib will be cmopletely restored if the periosteum is left; that it will be only partly reproduced if it is not left. This would at first thought indicate that the periosteum was reproducing the bone. But when we cap the ends of the bones these gaps are not filled in. The same thing has been found clinically where the shaft of a long bone has been completely destroyed by osteomyelitis in a child; the sequestrum having been removed, and the entire bone reproduced.

In the experimental cases of subperiosteal resection the bone was reproduced from the ends of the bone.

In the clinical osteomyeltiis destruction of the shaft, early in the inflammation defensive osteoblasts are thrown out between the bone and periosteum, and when the line of demarkation occurs this subperiosteal shell of osteoblasts reproduces the shaft. We conclude then that the periosteum is not osteogenetic **per se** but that it is a necessary element in the reproduction of bone as a limiting and guiding structure for the newly produced bone.

To prove its power as limiting membrane it is only necessary to refer to the subperiosteal resections and especially the subperiosteal fractures as seen in practice. A sub periosteal or green-stick fracture has but little callus because of this limitation. The fracture with the completely ruptured periosteum may have an excessive callus because of lack of periosteal limitation. It also may be of importance in relation to fractures because of its presence between the ends of the bones preventing union, again demonstrating its limiting power over osteoblasts, or it may have much influence in the deformity produced where it is ruptured on one side and not on the other.

### CORTEX

I think experimentation, as well as clinical observation, has very conclusively demonstrated that the cortex only reproduces bone. We wouldn't expect nerve to produce muscle, muscle to produce bone, nor tendons to produce blood vessels. In other words, like tissue produces like, so when we arrive at bone why not expect bone to reproduce bone according to the rule, for reproduction of other tissues?

We have demonstrated by numerous experiments in the resection of long bones, including the periosteal trough, that the only effort at reproduction is from the ends of the bones. We have also proved by numerous experiments that function is a necessity for its permanency.

We transplanted numerous pieces of long bones and ribs into the muscle and subcutaneous tissues, and while occasionally they made an abortive effort at reproduction this was invariably followed by a deterioration and absorption, because these transplants did not contact with living bone, and consequently had no stress to meet or function to perform.

We transplanted the split femur of puppies onto the side of the mother's femur, and there would be union, but the transplant was soon absorbed, just as excessive callus would have been, because it had no function to perform.

The power of bone to form its masonry, and later alter its masonry in order to meet the stress and strain of function is very remarkable. This power is at its zenith in the growing bones. This is nowhere better demonstrated than in fractures of the long bones in children where there is only lateral contact, often mal-alignment, and yet the masonry of the bony repair will be such as to take care of the immediate demands of function, and will continue to change for years until the normal contour of the bone has been completely restored; thereby giving it back its normal weight-bearing lines.

An excess of callus will always be found to be the result of necessity brought about by nature's efforts to repair badly displaced and mobolized fragments with distorted weight-bearing lines.

### THE MEDULLA

The medulla is essentially only a nutrient carrying structure. It is composed of a network formed for the purpose of carrying the internal blood supply of the bone. Its relation to the healing of fractures is so intimately associated with the circulation that they will be discussed together.

### BLOOD SUPPLY

The long bones receive their blood supply from the nutrient arteries, the metaphyseal arteries and the periosteal system.

It has always been our belief that the nutrient artery was the most important blood supply to the diaphysis of the long bones.

Recent experiments of Johnson, of Johns-Hopkins, (JOURNAL OF BONE AND JOINT SURGERY, JANUARY, 1927) have shown that the nutrient vessels supply the medulla throughout, and the inner half or two-thirds of the cortex; that the periosteal blood supply only nourishes the outer one-third or one-half of the cortex and is unable to afford a collateral supply; that the metaphyseal vessels also supply the medulla and the inner half of the cortex, close to the ends of the bones.

Any interference with the circulation undoubtedly has an effect on the healing of fractures.

Recent experiments of Morton and Sta-

bins (ANNALS OF SURGERY, SEPTEMBER 1927) show that ligation of the saphenous vein in dogs, thereby obstructing the normal circulation of the blood in the limbs would almost invariably cause non-union.

Unfortunately the long bones, with the exception of the femur in childhood, only have one nutrient artery. It may then be seen that if this artery and vein are torn across close at their entrance to the bone there would be a great lack of blood supply to the distal fragment. Consequently the study of the point of entrance of the nutrient artery of the long bones gives us a clue as to why we have non-unions in certain locations of the individual bones; these locations corresponding very accurately with the entrance point of the nutrient artery.

### THE EPIPHYSEAL LINES

Experiments from the time of John Hunter indicate that the growth in length of bones takes place entirely at the epiphyseal ends.

In addition to the numerous experiments that have been done to prove this, it need only be observed that if this epiphyseal line is destroyed in childhood by an inflammatory reaction, especially as occurs in smallpox osteomyelitis, the shaft of the bone ceases to grow in length. This has important bearing on fractures in young children, as some of the so-called fractures may be only epiphyseal dislocations, and these should, of course, be accurately reduced to prevent future deformity because of lack of growth in length of the bone.

The reactions of the above elements in their relation to the healing of fractures depends upon: First, the age of the patient; second, location of the fracture in relation to the nutrient artery and vein; third, the amount of trauma to bone and soft tissues; fourth, hematoma; fifth, accuracy of reduction and fixation; sixth, general diseases and dyscrasias.

The age of the person or animal receiving a fracture is so important in the healing of the fracture that we think one could almost make two classes of fractures, depending entirely upon the age. Much more can be taken for granted in dealing with fractures in children than with adults. Circulation in the bones is much better during the developmental stage, the embryonic cell reaction is much more prolific.

Reduction of fractures in children may be much less complete than those in adults and still get a much better ultimate result. The bone is only in its formative stage, and consequently more abnormal conditions may be cared for.

The location of the fracture in relation to the nutrient artery, the amount of trauma to the bone and soft tissues have an enormous effect on the healing. Where the trauma to the bone is great and fragmentation abundant there will be much more outpouring of callus, as each individual piece of bone that remanis viable will be an oscific center.

Hematoma, especially where there is much trauma during reduction, make a desirable pabulum for the dessimination and sustenance of osteoblasts. While this may be desirable in certain cases in the way of increasing the amount of callus it may be undesirable in causing too much callus if close to the joints, or oscified hematoma in the muscles which may have to be removed. or because of tension prevent the reduction of the fracture. Hematomas are especially pernicious in fractures of both bones of the forearm because of oscification and bridging between the radius and ulna.

The question of fixation of fractures is a much discussed subject, and one of relative importance. We, after observing the healing of bones in wild animals where there is no effort at reduction and fixation, and observing the great increase of callus where fixation is not complete, and occasionally the lack of callus and lack of union where fixation is absolute, believe that there may be such a thing as over-fixation.

### DISCUSSION

DR. MEADE CLYNE, Tucson, (Opening):—This is a very wonderful presentation and we all owe a vote of thanks to Dr. Brown for coming and giving it to us. He spoke, in introduction, about our getting tired of hearing him talk about bones; we will never do that. It is apparent that the regeneration of the bone in the bony defect takes place from the endosteum of the marrow, and the defect is closed in by the splinting process by the peristeum.

DR. R. D. KENNEDY, Globe, Ariz.:—There has been a thought in my mind as I listened to this paper. Dr. Brown took a piece of bone from a puppy and transplanted it to a bone in a dog; the the transplant disappeared and he gives as reason that it was because there was no function in the transplant. He transplants a rib into muscle tissue and the rib disappears, or periosteum into muscle and the periosteum disappears. I have been wondering whether that may not be from lack of function, just like the transplant from the tibia. That is just a question in my mind; I do not know the answer and would like to ask Dr. Brown's opinion as to what influence lack of function may have had in the disappearance of the periosteum. I do not remember the histological difference between the inner layer of the periosteum and the lining of the Haversian canals. If there is no difference and you strip the periosteum you have probably not removed all the periosteum, because some of it dips into the Haversian canal which may have the same structure histologically, and when you say periosteum has no osteogentic function, it may be because you have not removed all of it.

DR. D. F. HARBRIDGE, Phoenix:—The idea struck me, while listening to Dr. Brown and seeing last picture in which he showed certain definite bone changes after lapse of some time, that it may have

medico-legal significance. There are few things that will impress a jury more than a monstrosity in the form of a picture of a fracture. If the picture is taken early, instead of later when the results are better, it might be wise to impress on the jury that the appearance shortly after a fracture heals is rather crude, and that time will cause much of this roughness to disappear.

DR. H. T. BAILEY, Phoenix:—Would like for Dr. Brown to clear up this question: in Cincinnati, Indianapolis and other places, in doing submucous operations in the nose, we see the septum left very flaccid, nothing in there except the two layers of mucous membrane. Undoubtedly these operators leave the periosteum in, and with bone above and bone below why will not new bone form. Down here most of us leave in a piece of cartilaginous tissue which helps strengthen and stiffen the septum; we do not wait for it to grow back.

DR. GEORGE A. BRIDGE, Bisbee:—I hardly feel competent to discuss this paper, though we treat a large number of fractures. I have been much interested in Dr. Brown's researches on the bone functions of the periosteum. My opinion right along has been in line with his conclusions, even before his experiments, as I have read some of his papers before. I agree perfectly with him on that point. There are two thoughts particularly in relation to this paper; one of them is the matter of the circulation. I have had to handle many fractures during the past ten years and have had some very slow unions, and it has always been a question whether it was a disturbance of the circulation, or some other factor I did not know about. Very probably it was usually a profound disturbance of the circulation making the delayed union. We should be careful of two things in handling fractures, keeping in mind the points brought out by Dr. Brown. One is that fractures that cannot be satisfactorily reduced by the closed method, should not be allowed to go too long before the open method is used. I have had personal experience with that error, to my sorrow, trying all sorts of apparatus in effort to bring the broken fragments into position and getting nowhere, with final open reduction. That is a mistake, and these fractures should be immediately reduced on the basis of the principles brought out by Dr. Brown. This practice of immediate reduction is much better because the fragments are brought into position and scar tissues not allowed to form over the ends, resulting in more rapid union. Another point is that you should have patience when you have brought the fragments into position and do not despair because you do not get union in a few weeks. I recently had two badly fractured jaws from the same accident; the fragments were badly communited, with infection from outside and inside, many tooth fragments removed. After six months there was little union, but after nine months there was very good union, even though there was large destruction of tissue; it did not seem that they could grow together without operation, but they did. Have had the same experience with a fractured femur which came to open operation; after three months there was little union, but after five months perfect union. One must have patience in the treatment of these fractures. Am sure that we are all much indebted to Dr. Brown for his work on bone, and for this paper.

DR. C. A. THOMAS, Tucson:—Would like to emphasize, or draw attention again, to the difference in the treatment of fractures at different ages. That is a very important point which Dr. Brown brought out. Also we should remember the bearing the hematoma may have on the ultimate outcome of certain fractures, where it exerts a pressure which may prevent healing in cases which would otherwise get along well.

DR. J. I. BUTLER, Tucson:—I do not think Dr. Brown means to leave the impression that the periosteum should be disregarded in bone work. I remember a large number of people who came back from France with delayed closure of wounds. Dr. Brown's statements about bone nutrition explain many of those, which were mysteries to me. The peristeum had been stripped perhaps half an inch beyond the amputation, and there would be a perfect ring sequestrum thrown off before healing could take place. The periosteum cannot be ignored and stripped back with impunity and the bone left denuded, because this thin layer of bone whose nutritition is supplied by the periosteum is liable to undergo necrosis.

DR. VICTOR GORE, Tucson:—Would like to ask Dr. Brown a question which he may have covered. Is the amount of, and rapidity of formation of, callus dependent upon the completeness of the reduction? Another question; in cases of generalized arthritis with calcium absorption, what effect, if any, does the constitutional disturbance have on the rapdity of the repair of fractures?

DR. W. L. BROWN, El Paso, (Closing):—Dr. Kennedy, I did not understand your question.

Dr. Kennedy:—Where you accounted for the disappearance of the bone graft in the tibia because of lack of function and you deny the periosteum any osteogenetic power when transplanted into soft tissue. Woulu not lack of function be the cause here, the same as in the graft?

Dr. Brown:—That would be hard to get at. The osteogenetic function of the periosteum depends on whether the experiments are done on young bones and how the periosteum is raised. Raised with a sharp instrument, you would have a certain amount of reproduction because osteoblasts are transplanted with it. Williams' experiments in 1913 and '14 indicate that the periosteum would reproduce bone, but those animals were not allowed to live more than four or five months, which is not long enough. We contend that for a transplant to be permanent it must live as long as the host; otherwise, it is not permanent .

Medico-legal aspects are very important. Many of us have been guilty of considering the x-ray appearances instead of the fracture itself. I remember one instance in consultation with my friend, Dr. Crouse. I was called to his office one day and found him in a wild fury at himself, because he had just taken a fractured arm out of dressings, and here was the x-ray! He said it made him feel like quit practicing medicine. I told him to look at the arm and forget the x-ray; he had a most excellent functional result for a limb just out of splints; so I said to forget the x-ray and forget that he must judge by it. Dr. Harbridge says the situation is that many doctors and lawyers have learned to look at the x-ray as the last word. In some of these fractures shown here, I would be ashamed to show anyone the x-ray. If we will look at the limb and the functional result and pay less attention to the x-ray, we will have less trouble legally. I do not recall any case in El Paso where the x-ray has been offered in evidence; we have practically ruled it out.

With regard to the circulation. Recently I did one of the most inexcusable things in the treatment of fractures; it raised a commotion among the hospital staff. Had the temerity to put a Lane splint on a compound fracture of the tibia in the presence of a gas bacillus infection. Situation was this; wound wide open, bones in sight, distal fragment bearing down on the posterior tibial artery, foot badly discolored,—so why not? This is, of course, just one of those exceptional cases, but is cited to illustrate the importance of guarding the circulation in treating fractures. The man in charge of this patient says there is no doubt it saved the leg

and that in twenty-four hours the foot looked entirely different.

I do not think we have fully realized the part played by hemorrhage in the reduction of fractures. No doubt, hemorrhage has a great deal to do with preventing reduction of fractures, in reproducing the deformity. The hematoma is under the fascial layers, becomes tense and no doubt acts as a fulcrum in displacing fragments.

With regard to resection of the nasal septum, I do not know how to answer that. Septum is partly cartilage, which is very different because that does not produce bone.

## THE ARIZONA INDUSTRIAL COMMISSION AND THE MEDICAL PROFESSION

At a regular meeting of the Maricopa County Medical Society, on May 7th, attention was called to an action by the Industrial Commission which appeared to many of the doctors present to merit criticism. This was their announcement that certain employers insured by them had been instructed to refer all injured workmen to their medical advisor, who would direct them to the proper surgeon for treatment. The order affected the city of Phoenix, the county of Maricopa, the State Highway Department, and two other employers of Phoenix.

Motion was introduced that the Maricopa County Society take steps to initiate a recall petition of the Compensation Act, and appropriate one thousand dollars for this purpose. After some discussion, this motion was laid on the table until a special meeting of the Society, with a more representative attendance could be secured. This meeting was called for May 9th, at which time motion was made and carried that the Committee on Public Policy of the Society be asked to confer with the Industrial Commission and ascertain the reason for this action and the extent of their proposed orders. At a second meeting of the Society, held on May 12th, this committee (composed of Drs. Brockway, Bakes and O. H. Brown) reported and presented a letter from the Commission as their report. This letter was as follows

"Pursuant to your request we are submitting a statement of the matter concerning which your committee conferred with this Commission yesterday.

"The Industrial Commission was organized by statute some two years ago, not only for the purpose of determining compensation due and payable to injured workmen, but also for the purpose of conducting and managing the operations of a compensation insurance fund provided for in said legislation.

"The Arizona State Fund ranks today fifth or sixth in size of competitive state funds in the United States, and while said fund was started with a loan by the State of $100,000.00, said $100,000.00 is today wholly intact. The State Fund is the largest underwriter of compensation insurance in Arizona, and the conduct of same may not becontrolled by political expediency. The intent of the compensation law is that the State Fund shall be entirely self-supporting. We have made it so. All money paid by us for compensation and for hospital and medical charges is derived from the premiums paid to us for such insurance by the employers of labor in Arizona, and not in any wise from general appropriation.

"The Commission's actions may not be determined entirely from one point of view. It is our desire to co-operate with and to receive the full co-operation of the medical fraternity. Their viewpoint, however, may not properly be entirely the controlling one. Our responsibility extends both to the injured employee and to the employer who has taken his insurance with the State Fund. An appreciation by yourselves of these various controlling factors as regards our actions is the thing we ask in this connection.

"Pursuant to the above considerations and after observing the operations of the Compensation Law during the past two years, the Commission decided to establish an impartial system of referring injured employees for treatment.

We have observed numerous cases wherein disastrous results occurred due to an unfortunate choice of treatment made by the employee. The practical result in these cases is that a man will go through life maimed, without reason, and that the State Fund has paid and is paying for such disability, without reason. Such results could not have occurred under the system now proposed.

"The Commission felt that the best interests of all parties would be served if the attending physician in each case were selected on the basis of especial fitness to treat the particular type of injury sustained. The Commission has entrusted this selection to Dr. A. C. Kingsley, its Medical Examiner.

"Dr. Kingsley has retained the services of a registered nurse and both Dr. Kingsley and the nurse are employees of this Commission, receiving for their services fixed monthly salaries.

"A secondary reason for this plan of procedure is the absolute necessity, both from the viewpoint of the injured and from the viewpoint of the State Fund, that the Commission be in touch at all times with the cases of injury for which it is responsible.

"The Commission has notified several of the employers in Maricopa County whom it insures, including the Arizona Highway Department, the County of Maricopa and the City of Phoenix, to send all cases requiring medical treatment to Dr. Kingsley.

"Dr. Kingsley will himself provide treatment in cases of minor injury and will supervise the selection of the doctors in the other cases. In the discharge of this function he will be guided by two considerations only, to-wit, the selection in each case of a doctor especially fitted to treat the particular injury, and, secondly, to distribute the work in a strictly equitable and democratic manner among doctors equally suited and willing to do the work.

"A considerable portion of Dr. Kingsley's time will as has been the case in the past, be required for the examination and study of individual cases in which a medical question is involved, and upon the determination of which depends the amount of compensation payable to the employee by the Commission or by another insurance company. A considerable portion of his time will be required for the supervision of cases and consultation. We have authorized him to render such treatment of the injured employees as can be done without interfering with his other duties.

"The reasons applicable to the employment of Dr. Kingsley in Maricopa County might be con-

sidered as obtaining equally in other sections of the state. However, as provided by the compensation law, most large employers of labor furnish their own medical and hospital treatment, and Phoenix remains the only large industrial community where such is not the case. In this connection it might be well to cite the fact that many injured employees from all parts of Arizona are now being brought to Phoenix for treatment; and where in the past the large employers of labor have frequently seen fit to send their employees to El Paso for special treatment, they, at the request of the Commission, are now in practically every instance sending these men to Phoenix for such treatment.

"The confidence which the Commission has in the medical profession as a whole may be very definitely shown by the fact that in the handling of some twenty-five or thirty thousand cases of industrial accidents there have probably not occurred half a dozen cases where the Commission has ordered a change in the attending surgeons. We appreciate that there have been some cases of abuse of this confidence and some cases where better results would undoubtedly have been obtained under other arrangements or a closer supervision by our own medical adviser. These considerations may not be lightly passed over merely because we might feel that our stewardship in these connections would not be too closely questioned or analyzed.

"We assure the doctors that they need have no alarm over the plans of the Commission. It is not our desire to create, either directly or indirectly, a monopoly of medical treatment.

"As you know, there has been much misrepresentation and rumor relative to our plans, originating in the mouths of those who have no interest in intelligent, impartial selection of the attending physician, but whose interest may be in perpetuating their own monopoly, or whose interest may be political. Their criticism is incongruous, to say the least.

"We realize that no policy can endure unless it be sound and democratic. To insinuate or charge that we propose to create a monopoly of medical treatment implies an ignorance on our part of the fundamental principles which should govern the conduct of a public officer. It is not to be assumed that we are so short-sighted as to believe that the public would approve of any arrangement whereby the treatment of our cases would be concentrated in the hands of a select few. This Commission has enjoyed the most cordial relations with almost the entire membership of the medical fraternity in Arizona. From them we have received in general splendid co-operation. This has been of inestimable value to the Commission in the proper administration of the law. We appreciate it. We desire to retain it. And the change we are now proposing will, we believe, distribute the treatment of industrial injuries over a broader field. We hope thereby to strengthen the bonds between ourselves and the medical fraternity."

After considerable discussion, the following motion was made and prevailed:-

"That, instead of circulating a referendum, the whole subject matter be referred to the Committee on Public Policy and Legislation of the County Society in conjunction with the Committee on Public Welfare of the State Association, and that these two committees jointly take up the subject in point for discussion with the Commission, taking proper steps to urge remedying the law, if necessary."

This joint committee met on May 16th, and then met in conference with the Industrial Commission. While their report was still being formulated, another special meeting of the Maricopa County Medical Society was called on June 9th (by request of five members as provided by constitution). Although the report was not complete, it was presented in the following form by Dr. Watkins, the only member of the Committee on Public Welfare of the State Association who was present:-

The joint committees from the Maricopa County Medical Society, and the Arizona State Medical Association, to whom was referred the questions raised by the action of the Arizona Industrial Commission in designating one doctor in Phoenix to care for the injured employees of certain employers insured by the Commission, wish to make the following preliminary report:-

The joint committees met in Phoenix on May 16th, with Drs. Stroud, Randolph, Brown, Bakes and Felch from the Maricopa Medical Society and Drs. Gunter, Carlson, Harbridge and Watkins from the Arizona State Medical Association. After discussing various angles of the question, the joint committee sought conference with the Industrial Commission with two questions in mind, namely:-

FIRST:- Does the Commission have the legal right under the Compensation Act, to direct employers for whom said Commission acts as insurer, to send their injured employees to specified doctor or doctors and to refuse liability in case this direction is not complied with?

SECOND:- In case they do have this legal right under this Act, is our joint committee satisfied that they are acting justly and fairly with the medical profession in taking htis action in the known cases where they have so acted, and in claiming the right to act in other cases should they see the need?

Further, if this is the law, does the committee recommend any steps to change the law?

In considering these questions, it must be taken in mind that there are three groups of employees working under our Compensation Act.

(1) The large industrial corporations who have their own hospitals or hospital staffs and carry their own insurance.

(2) The smaller corporations or employers who insure their employees with private insurance companies.

(3) The employers, large or small, who insure with the Industrial Commission. For this latter group the Commission functions in a dual capacity. In the one place, they have the same function as any insurance company, with the same right of medical supervision over injured workmen insured by them; in the second place, they function as an Industrial Commission to determine the amount of disability and amount of compensation to be paid. These two functions must not be confused when considering the legality or justice of the Commission's actions.

With regard to the first question, the joint committee sought the opinion of Mr. Holton, of the firm of Sloan, Holton McKesson & Scott, the attorneys for the State Association. Mr. Holton's belief is that the Commission does not have the legal right, under the Compensation Act, to direct employees to a designated surgeon for treatment. However, Mr. Holton sat with us in the conference with the Commission, and will give us a more deliberate and judicial statement of his opinion on this point. The Committee also heard from Mr. Taheny, the attorney of the Commission, the statement of their legal basis for their actions. Mr. Tahney's opinion is that the Commission is within

its legal rights in this matter, basing his opinion on that section of the Compensation Act which speficies that the employer shall furnish medical aid to the injured employee. He admits that the Act does not postiively state that the employee must accept the surgeon selected or designated by th Commission, but he holds that this is the intent of the Act. That if the employer is held responsible for the surgical treatment and for the disability resulting from accident, he must also have control over the surgical treatment administered. He states that this same law, copied by Arizona from similar laws in other states, has been held by several Supreme Court decisions, to confer this right on the employer. The Commission, when it functions as insurer, takes over this right and acts as the agent of the employer; it is, therefore, entitled to name the surgeon who shall care for the injured employees of any concern insured by the Commission. Mr. Taheny will furnish us with a more detailed analysis of the legal decisions on this point.

With regard to the second question, as to whether the Commission has acted justly and fairly with the medical profession in carrying out this policy. Mr. Clingan, speaking for the Commission, stated that they are actuated solely by desire to see that the injured employees insured by them shall receive the best and most skilful surgical care and shall be returned to work with the least possible disability. While they have some interest in the insurance rate which mounts with the cost of medical care and length of disability, this is not their prime motive in directing certain employers to send their injured workmen to specified doctors.

Comparison was drawn with respect to the three groups of employers. In the large industrial towns of the state, where the mining corporations have hospitals, they have a direct interest in seeing that their employees receive the most skilful surgical attention. There is nothing the Commission desires to do, in such cases, except to encourage the employers to continue this type of care of their employees. The same thing holds true of certain corporations who do not have their own hospitals, but who designate certain surgeons to care for their employees; the Commission has no intention to interfere with such arrangements. The concerns who are insured with private insurance companies are also outside the scope of this conference.

However, the political subdivisions and in respect to certain employers, the injured employees are left pretty much to their own choice, or to the suggestions of friends or even disinterested bystanders, as to the doctor to be called when an accident occurs. It is in such cases as these that the Commission has directed that the injured employees shall be directed through Dr. Kingsley's office, in order that they may receive the proper attention without loss of valuable time. This is not with the idea that Dr. Kingsley will treat these patients, except in case of minor injuries, but in order that competent and skilful surgical attention may be secured without delay. A recent example in which a workman with a fractured back, following his own initiative, selected a chiropractor and was treated by him for a week before the Commission learned of it, and had him placed in the hands of a competent surgeon, was given as illustration of the need for such action by the Commission.

The Commission stated that they have no intention of issuing general orders to all employers insured with them, but do state that they reserve the right, under their interpretation of the law, to make changes in doctors whenever in their judgment the welfare of the injured workman is conserved by such change. They do not contemplate extending their action, at this time, beyond the scope already indicated, which includes the state highway department, the county of Maricopa, the city of Phoenix and two other employers in this county. They will not tie their hands however, by stating that they will never extend such action, should it develop in certain instances that the welfare of the workmen demand this.

Your joint committee is not, at this time, able to make a final report, as they do not feel that their work has been finished.

With regard to the first question, we are securing studied opinions from the attorneys of the Commission and State Medical Association, and will give these careful study.

With regard to the second question, the Committee cannot see where any injustice has been done to any surgeon, whether the action is entierly legal or not. The explanation of the Commission appears to us reasonbale. However, the joint committee will keep an open mind on this point and invite the criticism or statement of any doctor who feels that this action is unjust to him or to the medical profession.. We ask for written statements for our further consideration.

With regard to the action to be taken, we do not approve of any hasty action. There will be abundance of time to consider remedying the Compansation Act by legislative amendment. We believe it would be most unwise and foolish for any doctor in the state to lend his influence to an attack on the Compensation Act by referendum.

We believe the Industrial Commission is attempting to act fairly, justly and honestly with the medical profession, and we call upon the profession of the state to deal with them in the same spirit.

Dr. H. J. Felch presented a minority report from two members of the County Society as follows:

### MINORITY REPORT OF COMMITTEE

"The County Committee consisting of Drs. O. H. Brown, chairman, and Drs. E. C. Bakes and Harry Felch, with the President and Secretary met in a preliminary conference at the Arizona Club, May 23rd, 1928.

"The members of the State Committee on Public Welfare were also present. Dr. W. W. Watkins of Phoenix, Dr. Gunter of Globe and Dr. Carlson, president of the State Medical Association. Dr. Harbridge, secretary of the State Medical association and Mr. Holton, attorney of the State Medical association were also present.

"After considerable discussion it was found that $1,000 would not go very far towards making a change in the law whereby the Arizona Industrial Commission could be abolished by a referendum. Dr. Gunter gave an opinion that $25,000 would be necessary to complete the job. The out-of-town doctors were not in sympathy with our problem, for the reason that the mining companies in general carry their own insurance and the problem is not theirs. Dr. Gunter thought that the Maricopa County Society wanted to go off half-cocked to try to make such a fight, and was in accord that the commission could do what they pleased with the medical cases for which they paid the bills. He personally thought it was good business for the Commission to do so, not only from the standpoint of the state, county and city, but from all insurance under the Commission. After a few more tilts Dr. Watkins asked Mr. Holton to give

his opinion as to the authority granted the Commission under the law to compel the state, county, and city to send injured men to a physician of their choosing. His opinion was that the Commission could not legally do so, and that it could not be interpreted any other way, unless the Commission knew some way to get around the thing that he was unaware of. Dr. Gunter asked some questions relative to the wording of the law and the power of the Commission, after which the committee adjourned to the Capitol to meet with the Commission.

"As chairman of the state committee, Dr. Gunter was asked to act for the doctors. He stated that he was not the one to bring the question up because of his position on the point, but that he would do his best to represent us. He said he believed that we contended that the Commission exceeded their authority in making it mandatory for state highway, county and city employees, injured during their work, to report to Dr. Kingsley.

"Mr. Clingan, speaking for the Commission, said that they had given long study to the question, that they believed it legal, and were it not legal, he thought the medical profession would still stand behind the Commission if they knew the facts, and that they thought only of the unfortunate injured;—that certain evils had come up which they intended to correct, that certain members of the profession through lack of skill added to the expense of treatment for that particular case instead of referring it elsewhere, and that men went out into the world crippled beyond repair because of this unskillful care; that in a few instances the commission was mulcted maliciously for large amounts under false claims of injury, and at least in one instance one man was crippled by an operation not necessary from the standpoint of an accident case for which the Commission was responsible.

"On further questioning Mr. Clingan stated that it was not the intention of the Commission to go further at present, that two other employers, besides the three mentioned, had been notified of the fact of referring injuries to their man, that the Commission could NOT promise that it would not be extended further because they could not afford to tie their hands when injured men were not being handled correctly. He based his argument on the fact that at present all of the employees in question had to more or less find their way to a doctor of their own accord; that one case, a broken back, found his way to a chiro who promptly manipulated his back so that he will be a cripple for life, when he could easily have had no evil result. Further, ordinarily, other employers are more or less a family and that a workman's injuries were a big thing to the ordinary employer, that he saw that the man had a good surgeon, that he often had a surgeon employed to whom these cases were referred and took a lively interest in the fact that he got well promptly and without loss of limb. For this reason the Commission did not feel that the necessity had arisen where the order should be made general to all of the cases under their control, but could not tell us that the order would not be forthcoming. The committee gathered that as long as men were being adequately treated the Commission was disposed to let the order cover only those cases which are being cared for now.

"As to the legality of their action, Mr. Taheny explained that they were confident of their stand and quoted the intent of the law, and that while the power was not specifically granted the intent of the law was that they were responsible for the welfare of the injured man. He cited a lot of primitive Blackstone palpably irrevalent to a layman to this specific case but determining intent of the law. Mr. Holton asked if there were any parallel cases to this in any state where decisions were made covering this specific point, and Mr. Taheny quoted from a newspaper that same article as to the inadequacy of treatment he had read when a guest of the County Medical Society. He finally admitted that no such point had been decided.

,'Dr. Gunter asked that a test case be made of the next case that presented to decide the point, when Mr. Clingan made a plea that it be deferred until after the election of Nov. 8th, for otherwise it would be made a matter of politics during the election, a thing the Commission wished to avoid as they were now free, as free as public servants could be, from politics.

"Mr. Clingan told us that the medical profession was the Commission's best friends, that the workingman who was injured was his real point, that the added expense to the Commission was a minor point, but withal a serious one. The Commission earnestly desired to let us know that its purpose was altruistic, that Dr. Kingsley was, so far as he knew, as capable to decide who was the best physician to treat cases, as he himself did not do surgery, that he had no prejudice, and was a man of honor and capable of discharging his duties in a fair manner. Dr. Gunter told the Commission that he had heard nothing but good spoken of Dr. Kingsley during our session, but that any man in the same position would be under suspicion.

"It was brought out that if the Commission had suffered from either maliciousness or from lack of care in specific cases, it would be derelict in its duty should it not instruct Dr. Kingsley as to who was 'gypping' the Commission. The Commission hesitated to reply, but admitted the truth of the statement. This will amount o a veriable 'blackball' unless he Commission, either this one or some other, is disposed to be very fair.

"In conclusion, Mr. Clingan said that we were being made the catspaw of politicians in taking the initiative for a referendum on the act creating the Commission."

Motion was made and prevailed, that the Maricopa County Medical Society adopt the report read by Dr. Watkins as the preliminary report of the joint committees, and that they be instructed to continue their action with regard to adjustment of the situation between the Industrial Commission and the physicians in Arizona.

It will be noted from the preliminary report read and adopted by the Maricopa County Medical Society, that this joint committee is desirous of receiving WRITTEN criticsms of the action taken by the Industrial Commission, so far as it affects the medical profession. These will be given due consideration by the committee in making their final recommendations on this matter. Address such communications to Dr. Clarence Gunter, Chairman, Globe, Ariz.

# OPEN FORUM IN DIAGNOSIS

**In the May issue of this journal, two case histories were published with invitation to county societies and other groups of physicians in Arizona and New Mexico to suggest diagnoses, with such discussions as they might see fit to submit. Beginning in the fall, it is expected that one or more cases will be published each month, with the discussions on diagnosis a month or two later. For the two cases published in May, we have received discussions from Yavapai County Society and from the Staff of St. Joseph's Hospital, Phoenix. Below we publish these, together with the discussions of Dr. Cabot on the same cases.**

CASE NO. 1.

(From May issue of this journal, page 219 being Case 13201, of the Case Records of the Massachusetts General Hospital, published in Boston M. & S. Jour., for May 19, 1927, page 822.)

**Discussion by Dr. R. J. Stroud, Tempe, Ariz.**

(General Diagnosis, before the Staff of St. Joseph's Hospital, at special meeting on June 11, 1928).

Looking at this case broadly, the main factors involved in arriving at a diagnosis are:

(a) A young man, working in an industry where chemicals are used;

(b) A large sloughing necrotic mass in the mouth;

(c) A blood picture of some form of anemia, pointing more to a secondary type, but with color index at times above 1.

The history is negative, venereal is denied, the presence of an undescended testicle is noted, Wassermann is negative, Vincent's organisms are found in the slough of the mouth and in the stools, the urine is negative to repeated tests, icteric index 5, NPN 29 grams. The patient is pale and in poor physical condition. The blood shows great changes in amount of Hbg. red cells and white cells with degenerations of various kinds in the red cells, with Isaac's granules, and a constantly changing picture in the white differential counts, with immature forms, high mononuclear and low polynuclear counts. Urinary function tests show 50 per cent excretion, type of test not mentioned. Stomach has no free HCl and an index of only 5 in combined forms. Reflexes are increased, with ankle clonus constant. Clotting time, 20 mins.

The changes of blood pictures and their significance will be discussed by Dr. Milloy, so this discussion will be as to the general diagnostic factors represented by the above facts, and the blood finding discussed only as it relates to these things generally.

The palor of the patient is noted, but anemia and pallor are not synonymous. In general, the pallor of secondary anemia is greater than the blood picture warrants. Also, secondary anemias may carry at times a color index at one or above, and free HCl may be absent in secondary anemias.

There was no blood in the stomach contents or the stools, although there was gastro-intestinal pain, especially at night, relieved by enemata.

Temperature, pulse and respiration were as erratic and changeable as was the blood picture. No growth on blood culture.

The condition was generally progressive with short intermissions, and the spleen became manifest after he had been sick almost three months, and then just one month before death.

We have a history beginning only three weeks before and no data on his physical condition or blood findings, nothing to indicate what was wrong until pus was noticed at the gum line of the molars, probably lower right side. No mention is made of blue line of gums, wrist drop or whether mercurials had been taken, or drugs, before admission.

The main things which should be considered are: septicemia, pernicious anemia, syphilis, Vincent's angina and metallic or benzol poisoning. Purpura hemorrhagica has to be excluded. Septic endocarditis is a possible diagnosis.

**Septicemia:** The history is not suggestive, but the blood picture can be that of any toxin circulating in the blood, whether chemical or bacterial. The remissions of temperature, together with a known source of infection, even though only Vincent's organisms were found, point to a septic process more or less governed by the amount of absorption. It is stated that a streptococcus is always present as a deep infection below a Vincent's infection. Lack of resistance to the organism would account for the low leucocyte count as well as the lack of polys. Changes in temperature and pulse rates could be accounted for by a septic infection from a nonhemolytic streptococcus. The broadened heart with a systolic murmur can be compatible with toxic substances entering the heart muscle. Against the diagnosis is the long-continued illness, the gangrenous odor, the type of lesion, the particular type of red and white blood changes and the lack of finding the organism on culture. The picture is not typical, and if septicemia was present it was a secondary thing.

**Pernicious Anemia:** Many factors enter into the exclusion of this disease. Among the diagnostic points here are the fact of a high color index, lack of free HCl in the stomach, constant progressive anemia in spite of transfusion and the addition of HCl, stomach cramps, remissions, and the fact that a Vincent's organism, usually present in the mouth, became virulent, sore mouth, especially the edges of the tongue being one of the diagnostic signs of pernicious anemia. Fever is often present in pernicious anemia with periods of normal temperature. Certain it is that the blood picture could be only pernicious anemia when the primary anemias are considered. Ankle clonus is consistent with the disease, as also are the increased reflexes. Blasts are always present in pernicious anemia and are one per cent in this case. Lymphocytes are relatively increased as in pernicious anemia, perhaps absolutely here. Against pernicious anemia per se is the fact of a large gangrenous slough, the age of the patient, lack of history of diarrhea and constipation with the attacks. The face was pale and pallor rather than yellowish color is not descriptive of pernicious anemia. The course was too stormy and the fatal ending took place too soon for a straight case. In spite of this, a pernicious anemia with a superimposed Vincent's angina is very hard to rule out, although Isaac's granules would seem to be out of place with the picture.

**Syphilis.**—Syphilis can simulate all diseases and conditions and to have exhausted this disease and

its possibilities is to have gone through the calendar of medicine. Against the negative history is the fact of a latent acquired or hereditary type suddenly showing up without positive Wassermann. Nothing is said of mercurials being taken. The fact of being helped by neodiarsenol in part of the course of the disease, together with the finding of suggestive treponema, make syphilis a big possibility, and there is always the fact of a superimposed Vincent's angina on any other process, as a great percentage of people carry these organisms. However, the patient did not show any stigmata of hereditary syphilis, and a tertiary lesion would hardly have been as virulent. He would have developed some immunity to the disease and his arsenicals would certianly have helped unless he was arsenic sensitive, a fact not borne out by the history of the case, for the only improvements noted was following neodiarsenol, but not sufficient to do more than give a small measure of relief. Also against the diagnosis of syphilis is the fact of lack of enlarged glands of the drainage region. The blood does not parallel the usual one of syphilis, although any secondary blood change may be part of the disease. High monouclear count is not a part of syphilis and the high color index is not usual with the toxins from this condition. The usual attack of syphilis on the spleen sufficient to enlarge this organ, generally has a counterpart in the liver, which is not borne out here either in size or in the icteric index. Usually, HCl is increased when a stomach is syphilitic, and ulcer can usually be demonstrated by x-ray methods, neither of which have been demonstrated here. The bowing of the shins points to a latent syphilis but the thickening of the bone is not demonstrable by x-ray. The skull x-ray is also negative, ruling out bone syphilis here as well as Paget's disease. Ankle clonus is not often present in syphilis although early tertiary syphilis would be consistent with increased reflexes. The peculiar lethargy of the case beginning late in February, would be consistent with a gumma of the brain, and the whole train of events, with the fetid breath beginning the process and ending with a veritable noma, could clinically follow an untreated syphilis in the tertiary stage. The blood pictures, negative Wassermann, lack of finding definite treponema and the changes taking place without all of the organs being greatly affected, rules out syphilis if this disease can ever be ruled out.

**Vincent's Angina:** Whatever the diagnosis, this is the hardest disease to positively rule out of the picture. First, we have the positive finding of the Vincent's organism, both in the mouth and the stool. The blood picture can be that of an anemia peculiar to the disease. Whatever the exciting cause. Vincent's angina can be added to the picture in the matter of a progressive fatal disease, especially when localized in the intestine, and sufficient absorption could have come from the mouth alone to have killed the patient. The helping of the patient temporarily by the use of arsenicals is also a factor in clinching the diagnosis The fact of the spread into the antrum and the ear is characteristic of Vincent's disease. The fact that other organs, even the kidneys, being negative, strongly supports the diagnosis. The long clotting time, while more suggestive of a purpura, can be accounted for by any toxin which purpura, can be accounted for by any toxin which would act on the coagulent forces in the blood, for purpura itself is caused by toxins when not of the idiopathetic variety. Against the diagnosis is the fact of so many blood changes, a lack of constant progression in so fatal a case, Isaac's granules which art generally due to chemical irritants as opposed to bacterial toxins. Vincent's may be only a secondary disease in the light of other toxic irritants.

**Metallic poisoning:** In this industry certain irritant poisons could make the picture seen here. Lead or arsenic, or both, could be factors. The fact of a Vincent's angina following the toxic poisoning is compatible with the findings, for Vincent's is especially liable to take place with an overdose of the heavy metals, especially mercury, lead and arsenic. The blood picture can be that of a long-continued arsenic or lead abuse. Lead especially makes a peculiar secondary anemia which gives a changing picture of blood under the microscope; the clotting time is disturbed, Isaac's granules are part of the picture of heavy metal abuse more than bacteria, and the whole picture of anemia, slough, stomach pains, changes of reflexes and weakness and pallor can be said to more nearly simulate the heavy metal type of picture than either of the other conditions mentioned. Combining this with a Vincent's organism would account for all of the things that have taken place. Against this is no history of blue line on the gums, lack of knowledge of taking mercury or being in the factory long enough to become soaked through any metal used in the industry. It is very hard to rule a heavy metal poisoning out, when thought of in combination with a Vincent's angina. Benzol may be included as having the same effect on the blood.

**Diagnosis:-** First choice, Vincent's infection. Second choice: Poisoning by some metal.

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**Dr. F. J. Milloy, Phoenix.**

## (Discussion of laboratory findings, before St. Joseph's Hospital Staff, June 11, 1928).

The diagnosis of this case, from the laboratory findings, rests between an infectious process and a disease of the blood-forming organs. It seems quite certain that the organism isolated from the ulcer on the lip is Vincent's angina. This supposition is borne out by the fact that neodiarsonal was subsequently given in the treatment. The blood picture suggests disease of the blood-forming organs, more particularly pernicious anemia. The gastric achylia would fit with pernicious anemia but does not prove it. The test for rennet, which would prove that this is a true gastric achylia, was omitted. There is certainly an extreme anemia with positive color index but this entire picture can be a part of the secondary anemia. There are no nucleated red cells. If nucleated red cells are absent during a remission in pernicious anemia, we are not surprised, but during a relapse the nucelated cells will certainly be found at some time. If not, we are very likely not dealing with the pernicious type. The same applies to the platelets. The blood platelets are never nromal in a relapse of pernicious anemia. They are reported in this case as normal at one time and abnormal at another time. Neither would they be normal in an aplastic anemia. The differential blood count goes into considerable detail but the most outstanding thing is the absence of the transitional form of cells so it seems safe to assume that this is the picture of a secondary anemia and not a primary. The blood chemistry, icteric index, urine examinations and kidney function are normal. Later in the disease, we find a much more acute condition. In this stage we find a leukocte count of 15,300. This finding is decidedly against primary blood disease and strongly indicative of an acute infection. There is a rather high lymphocyte count also. There is very little in the literature on virulent infections produced by Vincent's angina but what is given states that a high lymphocyte count and an extreme anemia go with a virulent infection. A case reported by Dr. McIntyre this

winter on a virulent infection of the uterus produced by incent's agina, gave a blood picture of extreme anemia. The blood picture just previous to the fatal ending of this case shows the extreme anemia with a red count of a little over a million and hemoglobin of 35 per cent with a high leukocyte count and blood platelets normal at one time and abnormal at another. This seems to definitely rule out the pernicious and aplastic anemia and points to a definite diagnosis of an acute infection which, no doubt, is Vinrent's angina, which has formed a local infection on the lip. This general infection has produced death.

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**George O. Bassett, M. D., Whipple, Ariz.**

## (Discussion before the Yavapai County-Fort Whipple Discussion Group).

I will discuss this case from the viewpoint of the blood picture. In order that you may bear in mind the blood picture which I will attempt to discuss. I have prepared a chart (Chart 1.) which cites briefly various features and characteristics of this patient's blood which was shown on various examinations. A study of this blood picture compels us to realize that we are dealing with a fairly acute condition, one which in this case resulted in a moderately rapid death. Knowing, then, that we have a serious condition to consider, we are forced to make our differential diagnosis from among those various anemias which we know terminate fatally and with a fair degree of rapidity.

Three conditions come to our mind which we believe are somewhat simulated by this blood picture; namely, the aplastic anemias, pernicious anemia, and the graver types of secondary anemia.

Of these, first we will consider the aplastic anemia from the standpoint of the chart shown (Chart 2). For all purposes, we can discuss the idiopathic aplastic anemias and make our comparison from that, for all the anemias of this type more or less resemble the idiopathic form. The aplastic anemias are characterized by a failure of the blood-forming organs to make effort at regeneration. Therefore, if we show that this patient possesses ability to any degree to regenerate blood, we have successfully eliminated the aplastic anemias. Glancing down the table in Chart 1, we notice that these various blood pictures show the presence of reticulated cells, stippled cells, macrocytes and microcytes and that there is a definite poikilocytosis and anisocytosis, all evidence of the ability of this patient's blood to regenerate. In addition to this, we note that a comparison of the first and second admissions to the hospital, although an interval of two months intervened, shows a definite variation, not only in the total number of red cells but also in the leucocyte count, which show decided tendency to respond to stimulation. We are forced, therefore, to eliminate from our consideration any of the so-called aplastic or regenerative anemias.

Pernicious anemia (Chart 3) is a little bit more difficult to eliminate as a diagnosis. A study of this chart shows that the comparison between blood findings in this case and those that we know exist in pernicious anemia, shows a more definite resemblance. In pernicious anemia we have a leucopenia; we have a relative lumpocytosis, we have a progressive reduction in all types of cells, as we have here. In addition, in pernicious anemia, there is as in this case, a definite attempt at regeneration. We have the presence in pernicious anemia of reticulated cells, stippled cells, of the macrocytes and microcytes and the presence of poikilocytosis and anisocytosis. In pernicious anemia we have more than this man shows, for the evidence of regeneration seems to be a half-hearted attempt and not nearly so clear-cut and well defined as the attempt that is made in pernicious anemia. In pernicious anemia one of the most typical findings is the presence of megaloblasts and normoblasts, the nucleated red cells which are typical of regeneration. These are absent in this blood picture. In addition, we have an achromia, which is never found in pernicious anemia. To the contra-wise there is an absence of a polychromatophilia, which is quite typical of pernicious anemia. Third, we have a questionable plus color index and in the absence of any definite statement it is impossible to say what this patient's color index was. Fourth, this patient's coagulation time ranges from twenty to thirty minutes, and in pernicious anemia it is usually normal or slightly above normal. These four points, together with the clinical picture that we have of a very anemic, wasted individual, compel us to conclude that this could not be pernicious anemia. Although it resembles it in many characteristics, at the same time there is sufficient variation in the blood picture and such marked contrast in the clinical picture that we are satsified that true pernicious anemia does not exist.

That leaves us only the severe secondary anemias to consider (Chart 4). The more severe types of secondary anemia may be due to many and varied causes. Briefly, they may be grouped together under the heading of malignant growths, prolonged and severe hemorrhages, certain of the acute infectious diseases which fail to terminate favorably and the various septic processes, which are legion. We know that this man had a septic process. He was admitted to the hospital with a definite and severe infection of the mouth and gums. The diagnosis on direct smear shows Vincent's angina and possibly other organisms as contributing factors. This infection progresses and shows little or no tendency to heal and a gangrenous process becomes implanted, which further complicates the picture, so we see that we have sufficient infection about the mouth of this patient to give cause for a severe anemia.

Malignant growths, severe and repeated hemorrhages and a definite infectious disease, are causes we can rule out on history alone. The blood picture in a severe secondary anemia, due to whatever cause, may closely simulate the blood picture in any type anemia. However, as we have shown in our differential diagnosis of the two preceding conditions, there is usually sufficient difference in essential character to allow us to make a definite diagnosis. In a severe secondary anemia due to septic process there is, besides, the gradually increasing anemia (as indicated by the fall in the red cells, the white cels and the blood platelets, a normal tendency for the cells to regenerate. William Osler states that, in severe secondary anemias due to septic processes, the attempt at regeneration is usually enfeebled and irregular, due to the toxic action not onnly on the circulating blood but on the blood-forming organs. This, then, would account for the somewhat irregular picture that we have here. As stated previously we have here an achromia; this is characteristic of a secondary anemia in comparison with a pernicious anemia. The presence of a definite though irregular attempt at cell regeneration, the marked prolongation of the coagulation time and the attempts made by this patient as indicated or as shown by the definite leukocytosis, are all suggestive of the reaction that occurs in the body in any septic process. The man's clinical condition is also suggestive

We are, therefore, able to eliminate all other conditions leaving us only a secondary anemia due to a septic process as a factor. My colleague (Dr. Loewy) will discuss further this diagnosis.

CHART I.

*Composite Blood Findings in Case No. 13201.*

1. Anemia.
2. Relative lymphocytosis.
3. Moderate to marked achromia.
4. Red Cells, 1,120,000 to 3,700,000.
5. Poikilocytosis.
6. Aniscocytosis.
7. Stippled cells.
8. Reticulated cells.
9. Macrocytes and microcytes.
10. Leucocytes 3,500 to 20,400; Relative leucopenia to definite leucocytosis.
11. Polys, 1 to 64 per cent.
12. Lymphoblasts, 1 per cent.
13. Hemoglobin, 35 to 80 per cent.
14. Platelets decreased and abnormal.
15. Coagulation time, 20-30 minutes.
16. Clot retraction time normal.

CHART 2.

*Aplastic Anemia.*

1. A disease in which there is no active regeneration of cells, red, white or platelets.
2. Steady reduction in quantity of red and white cell.
3. Minus color index.
4. Progressive leucopenia.
5. Platelets reduced.
6. Bleeding time prolonged.

CHART 3.

*Pernicious Anemia.*

1. Decreased red cells, to normal.
2. Hemoglobin reduced.
3. Plus color index
4. Poikilocytosis.
5. Anisocytosis.
6. Macrocytosis.
7. Definite and active regeneration
   i. e. Polychromatophilia.
   Basophilic granulation.
   Cabot's ring bodies.
   Nucleated red cells.
8. Megaloblasts.
9. Myelocytes.
10. Leucopenia.
11. Relative lymphocytosis.
12. Myelocytes present.
13. Platelets diminished.
14. Anemia not indicated by physical appearance.

CHART 4.

*Severe Secondary Anemia.*

1. The blood picture may present all the features or nearly all of a pernicious anemia, or an aplastic anemia of a low grade.
2. Usually there is definite anemia that varies in intensity.
3. A leucopenia that is relative.
4. A relative lymphocytosis.
5. Moderate achromia.
6. Never polychromatophilia.
7. Evidence of cell regeneration, not so marked as in pernicious anemia, but enough to be positive.
8. Minus color index, never plus.
9. Macrocytes and microcytes present in small numbers.
10. Occ. stippled cell and recticulated cell.
11. Platelets diminished.
12. Seldom a severe leucocytosis unless the anemia is due to a severe infection, then never constant.

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I. D. Loewy, M.D., Whipple, Arizona.

(Discussion before the Yavapai County-Fort Whipple Discussion Group).

This case history presents for our consideration three very important factors: first, a rubber factory operative; second, a sloughing ulceration of the lower lip; third, an anemia, with a very peculiar blood picture.

A prominent author on industrial medicine states that whenever we are called upon to treat a rubber factory operative, it is absolutely necessary that we ascertain just what his work is in the factory and whether or not he comes in direct contact with various chemicals used in this industry. In this case there is nothing in the history which tells us his exact work in the rubber factory. Therefore, exposure to certain chemicals can be inferred, but we are not absolutely sure of our inference. Crude rubber is usually cleansed of impurities in the factory and then rolled into sheets. If the rubber is to be vulcanized, it is mixed with sulphur, in various proportions. Substances such as lead, antimony and zinc, and coloring matter are often added to it. If the rubber is to be used in a liquid form, it is dissolved in either carbon bisulphide, cardon tetrachloride, benzol or naphtha. We are unable to determine, from the history, whether this patient was exposed to any of the above chemicals, but, if he was, the lead is apparently not a factor, as it produces a blue line around the gums, multiple neuritis, as shown by wrist drop, lead colic and metallic taste in the mouth. None of these symptoms is present. The sulphur does not produce any bad results. Carbon bisulphide and carbon tetrachloride expend their energies upon the nervous system, producing especially optic nerve disturbances. Naphtha is apparently harmless. Antimony produces symptoms similar to arsenic poisoning. This patient has no history of diarrhea, cramps, etc., only one pain in the abdomen being mentioned, which was relieved by an enema. This leaves benzol which must be considered in the production of this profound anemia.

Taking up the second factor of this patient's condition, we note a very severe and intense septic process in his mouth, which extended to his sinuses and was subject to slight improvements, but eventually became a very deep and profound process, the nature and extent of which can be judged only by the foul odor and sloughing, as his mouth could not be examined satisfactorily. This septic process could cause the profound anemia, the process causing an anemia and anemia permitting further sepsis, establishing a vicious circle, to which this patient's death might easily be attributed.

This is a very stormy blood picture. The blood count goes up and down and up and down. The characteristics of the blood count have been presented to you by my predecessor. There is a notable diminution of the white blood cells and the red blood cells and the hemoglobin, the granular leucocytes suffering the most, the polynuclears ranging from one per cent to sixty per cent, the total count ranging from 3,000 to 20,000. There is evidently very little attempt at blood regeneration and what there is is shown more in the red blood cells.

Anemias are classically divided into primary and secondary. The primary anemias are pernicious anemia and aplastic anemia. Pernicious anemia can be ruled out in this case by the lack of the lemon-yellow color, his emaciation and the absence of polychromatophilia and blasts in his blood. Also there were no hemorrhages. In pernicious anemia we have a blood destruction, with hyperplasia of the red bone marrow, which, in its attempt to answer the emergency call for more red cells, throws out into the blood stream many immature red cells, which consist of nucleated reds, microblasts, normoblasts and megaloblasts. None of these are present in this blood.

Idiopathic aplastic anemia is characteristized principally by a failure of the hemopoietic areas in the red bone marrow to produce granular leucocytes, leucocytic count being reduced many times below a thousand. There is nothing definite enough in the blood picture to show an idiopathic anemia. If it exists at all, it is a partial aplastic anemia, secondary to a chemical poisoning and will be discussed later. Secondary anemias are toxic, intoxication, post hemmorhagic and secondary to malignant disease. There is a form of aplastic anemia known as myelophthisic anemia, which is caused by replacement of the red bone marrow with metastases from a malignant growth. In this case there has been no malignant growth discovered and the x-rays of the bones show no metastases. There is no hemorrhage in this cast to account for a post hemmorhagic anemia. This leaves us to discuss intoxication anemia and toxic anemia. Previously we have eliminated all intoxication anemias except that caused by benzol. We cannot absolutely rule this out, excepting that there is evidence in the red blood cells of an attempt at regeneration, reticulated red cells being found and, in spite of the leucopenia, there have been several sharp leucocytoses. If this case is one of aplastic anemia, due to benzol poisoning, it could be considered one of partial aplastic anemia, but it is not characteristc. Toxic anemia may exist, caused by the profound septic mouth condition, septic temperature, infection of the various sinuses, stormy course and increase of this septic slough to the point of widespread gangrene. One is inclined to believe that this septic head condition plays an important part in the production of the anemia and death of the patient.

Our diagnosis is (1), sepsis, result of infection about the mouth and teeth, probably Vincent's angina, with secondary anemia; (2) barely possible intoxication and partial aplastic anemia, from benzol poisoning, which cannot be absolutely ruled out because of absence of any data in the history as to exposure to this chemical.

## DIFFERENTIAL DIAGNOSIS

DR. CABOT: This seems to be a process starting in a mild ulceration, about the first of December, and ending in death toward the end of April, five months. So far as I see the mouth lesions were primarily, i. e. were the cause of the other troubles. One always wonders in the presence of anemia whether ulcerations such as these are not secondary to the anemia or to some other process in the bone marrow or elsewhere that we do not easily see. But I do not see any reason to suppose so here. I do not see why we should not say that this is an ulcerative process of the mouth, very possibly associated with Vincent's organisms, and resulting in a stubborn type of anemia which got better and then got worse, and showed peculiarities which I cannot well explain. There was a large percentage of reticulated cells, which ordinarily shows good effort at regeneration; on the other hand a small percentage of polynuclears, so that the effort did not include that side of the blood-making tissue. Whatever toxin is responsible for this condition seems to be depressing the red side of the blood forming tissue rather than the white. It does not fit pernicious anemia in a number of respects. We have no evidence of a primary bone marrow tumor. The spleen did not become enlarged till towards the end. He had no enlargement of the glands, and therefore I do not see why we should think of neoplasm of the hematopoietic system.

The striking thing all through the case is that there is nothing to cause the anemia except in and around the mouth, (including the accessory sinuses.) If there is pathology elsewhere we have no way to know it.

I predict that Dr. Richardson will not reveal any source for this anemia other than that which is shown in the local lesions: septic anemia. I should like to know if any other opinions were held on that.

DR. HUNTER: We thought he might have a malignant lymphoma, which sometimes gives a low-grade infection of the mouth. This suggestion was one of the reasons why x-ray therapy was considered and given a trial. I do not see that it did any good.

DR. CABOT: Did anybody say where the lymphoma was?

DR. HUNTER: No. He had a pain in his abdomen.

DR. CABOT: That is the difficulty, isn't it? Were any other alternatives that you know of considered?

DR. HUNTER: Benzol poisoning also. He worked in a rubber factory as a cotton man, but we could not make out that he had had any exposure to the chemicals or solutions.

CLINICAL DIAGNOSIS (From Hospital Record)

Ulcerative stomatitis.
Anemia, secondary.

## DR. RICHARD C. CABOT'S DIAGNOSIS

Ulcerative stomatitis (due to Vincent's organism?)
[Secondary (septic) anemia.]

## ANATOMIC DIAGNOSIS

1. **Primary fatal lesion.**
   Extensive ulcerative gangrenous stomatitis.
   Secondary (septic) anemia.
2. **Secondary or terminal lesions.**
   Purulent sphenoidal and ethmoidal sinusitis.
   Small area of softening, left frontal lobe of brain.
   Hyperplasia of the bone marrow.
   Infarcts of spleen and kidneys.
   Soft spleen.
3. **Historical landmarks.**
   Meckel's diverticulum.
   Chronic pleuritis, right.
   Small areas of fibrous myocarditis, wall of left ventricle.
   Undescended left testicle.

DR. RICHARDSON: He was an emaciated white man. The examination of the head showed a very extensive foul-smelling gangrenous stomatitis involving the roof of the mouth and extending into the region of the sphenoidal sinuses. The sphenoidal and ethmoidal sinuses and the posterior nares contained much foul stinking necrotic material The brain weighed 1285 grams and showed no definite lesions except that in the left frontal lobe, the anterior third, and in the white matter, and extending to the cortical region on the left lateral aspect, htere was a small area of past, softening. The bone marrow of the right femur was abundant, filled the cavity, was brown, rather meaty, and was cut out easily. Microscopic examination showed hyperplasia of the bone marrow presumably the hyperplasia that is associated at times with extensive sepsis.

The peritoneal cavity and the gastro-intestinal tract were frankly negative. There was a small Meckel's diverticulum. The mesenteric and retroperitoneal glands were negative.

The lungs showed pale red spongy tissue which yielded a small amount of reddish frothy fluid. There were no areas of pneumonia.

The heart and the circulatory apparatus generally were frankly negative. There were a few very small areas of fibrous myocarditis, of no significance.

The liver, gall-bladder, pancreas, spleen, and adrenals were negative.

DR. CABOT: We have had an extraordinary number of anemias here and at the Peter Bent Brigham Hospital this season—I have never seen anything like it—anemias that were not pernicious and were not the ordinary type of secondary anemia, and that in two cases were thought in the end to be bone marrow tumors of the hematopoietic system. In one case we have never so far as I know found the cause,—a case in which there was some evidence of benzol poisoning, but not enough to be convincing. I suppose it means that we now make a more careful study of anemias that in the old days would have been called pernicious anemia and nothing else. These cases were all easily distinguishable from pernicious anemia, but when we got beyond that it was difficult to say anything with certainty.

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C. R. K. Swetnam, M.D., Prescott, Ariz.

## (Discussion of Case 2, before Yavapai County-Fort Whipple Discussion Group).

Assuming that all of you have read this history we will not go over it again, but there are a few points we wish to emphasize. A girl of 20 entered the hospital complaining of profuse bleeding from the nose. She had worked in a rubber factory for eight months and for the last four months had been weak and had digestive disturbances, these symptoms gradually increasing. Her work was cementing rubber heels. On examination two things attract our attention as being of the greatest importance. They are very profound anemia and evidence of infection around the upper respiratory passages. It seems to us that all symptoms and findings can be attributed to those two things. Weakness, dizziness, purpura, bleeding from mucous membranes (nose, mouth, vagina, gastro-intestinal, and lungs), loss of weight and appetite. She had sore gums, sore throat and tenderness over both mastoids. An x-ray showed both antra were "much less than normally radiant." Her temperature ran from 100.3 degrees to 105.8 degrees and with wide daily variations, which means it was continuous.

The first thing we consider is the anemia; because it seems to us the most important. What form of anemia have we? We have only 1200 white cells and of these 16 per cent polymorphonuclears and 76 per cent lymphocytes—a very marked leucopenia, especially characterized by decreased polymorphonuclears and apparent but not actual increase in lymphocytes. The reds are 1,715,000 and there are no blasts nor other forms of immature cells, and the platelets are practically absent. The hemoglobin was 40 per cent. Now, the lack of any immature forms of red cells and the extremely small number of polymorphonuclears shows that the red bone marrow is not functioning at all, or very little, and proves this to be an aplastic anemia. In studying the etiology, we find a good many diseases causing a secondary aplastic anemia; and, also, an idiopathic aplastic anemia, which simply means that in some cases the cause has not been found. But among the known causes are chronic benzol poisoning and sepsis. In this case we have evidence of both, but we believe the sepsis is secondary.

Let us consider the question of sepsis. Four years previously the patient had "growing pains" in the legs, which probably meant some focus of infection. But after this she was well and attained her best weight. One year before admission she had an abscess of the ear, which cleared up in one week, suggesting that she had nothing chronic at that time. Then, there is no more suggestion of any kind of infection until after she had had for some time symptoms referable to anemia. The evidence of infection in the terminal stages will be mentioned later.

The next question is: What is the relation of her occupation to her present condition? As we have mentioned, her work was cementing rubber heels on rubber shoes. Rubber cement is made by softening pure rubber (cut fine) in carbon disulphide, then dissolved in benzol. The benzol is very volatile and, as it is only a solvent, it does not enter into any combination with rubber, but all goes off into the air. As you know, about 80 per cent of benzol is absorbed by the human body when exposed to a mixture of benzene and air. Santesson found that, in eight cases out of nine of benzol poisoning, the employment in benzene charged air was from one week to four months and all in girls between 15 and 20 years of age. It was also found that, in cases where chronic poisoning has occurred, the atmosphere contained more than 20 parts benzol per 10,000 of air. Most factories have changed from benzol to naptha as a solvent. Benzol is derived from fractional distillation of coal tar and is among the first products to come off, being much more volatile than naptha. Chronic benzol poisoning takes the form of an aplastic anemia with subcutaneous hemorrhages and bleeding from mucous membranes as terminal changes. Benzol is a powerful leucotoxin, destroying the white blood cells and the parenchyma of the blood-forming organs. The myeloid tissue is damaged more than lymph glands and so affects the polymorphonuclears more than the lymphocytes. The erythroblastic tissue of the bone marrow is also destroyed, although the red cells in circulation are damaged relatively less. Because of its property of destroying leukocytes and leukoblastic tissue, benzol was tried as a treatment in leukemias, and that gave opportunity to study its effects. It reduced the leukocytes all right, but it damaged the erythroblastic tissue of the bone marrow and aggravated the anemia. It also reduces the platelets, and causes digestive disturbances, is injurious to the heart muscles, is an irritant to the kidneys, causes a lighting up of latent infections, and, in large doses, produces a hemorrhagic tendency. For chronic benzol poisoning there is no treatment yet developed and the effects are likely to continue after the toxic influence has been withdrawn. This case seems to us to fit in exactly, and the effects mentioned would account for the infections around the nose and throat. There was a latent tonsil infection and the influence of the benzol poisoning caused it to become active, and to spread to the ear and probably to the gums. A dentist found evidence of Vincent's angina, but as far as we know that was not confirmed and no more attention was paid to it. The fever was probably increased by the infection, but in aplastic anemia there is fever, so much that it may be confused with typhoid, and in this case a Widal was done and found negative.

Our diagnosis is chronic benzol poisoning with the pathologic findings of aplastic anemia, which it caused. Benzol has not been demonstrated in the tissues.

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E. A. Gatterdam, M.D., Whipple, Ariz.

## (Discussion of Case 2, before Yavapai County-Fort Whipple Discussion Group)

In aplastic anemia we have an inability of the bone marrow to produce new cells. It is due to destruction of the bone marrow by fatty changes, or by crowding out of the hemapoietic centers by tumors. The latter is classified under myelophthisic anemia. Primary or idiopathic anemia is a progressively fatal disease, the cause of which is

unknown. This type of anemia, caused by benzol and trinitrotoluol poisoning, radium, roentgen rays, and certain infections, as typhoid and sepsis, is usually considered a secondary anemia, and the prognosis depends upon the extent of destruction of the bone marrow. It occurs chiefly in young girls.

The effect of benzol is cumulative so that the condition progresses after removal of the poison. It probably has a direct affinity for the bone marrow and the conversion of it into fat. The x-ray and radium rays act probably directly on the bone marrow with destruction of it, as it is more or less embryonic in type. Comparative studies in treatment show that these rays are of more value in the leukemias than is benzol, because localized areas can be treated, whereas benzol affects the entire bone marrow. The marrow of the short bones is attacked in benzol poisoning, consequently the red blood corpuscles are affected and their production inhibited.

The blood picture in this case shows an absence of regeneration on the part of the bone marrow, in that there are no young red blood cells, such as normoblasts, megaloblasts, etc., because of loss of function of the hemapoietic centers. The red blood cells in the circulating blood in this type of anemia are fairly normal except for a slight increase in the fragility. All the white blood cells are reduced quite markedly, except the lymphocytes. This gives a relative lymphocytosis, as is shown in this case. The lymphoid tissue of the body apparently is little affected in this disease. The blood platelets are markedly reduced and, as a result, purpura and hemorrhages develop. Even after repeated blood transfusions, the red cells are reduced quickly. This is due to the lack of platelets and the resultant hemorrhages.

The chief things to differentiate in this case are: secondary anemia, idiopathetic purpura and myelophthisic anemia. Of the first, the differentiation in a marked case is easily made by the blood picture. In idiopathic purpura there is a marked diminution of the platelets, which is the chief finding of the blood. Also, in this condition the reaction of the bone marrow to hemorrhages is normal, whereas in aplastic anemia this reaction is lacking, and there is a relative lymphocytosis. Hemorrhages in aplastic anemia usually occur late in the disease. In myelophthisic anemia the differentiation is made by finding the tumors in the bone marrow.

In this case, the history and physical findings coincide with the picture of an aplastic anemia caused by benzol poisoning. It is the case of a young girl, with history of exposure to benzol which is followed by anemia of the aplastic type and uncontrollable hemorrhages. In the autopsy we should expect to find a marked fatty degeneration of the bone marrow of the long bones and a lesser destruction of the red marrow in the short bones, as the red cells are less affected than the white cells.

**Group Diagnosis:-** (1) Benzol poisoning, chronic.
(2) Secondary aplastic anemia.

## Discussion

**By Richard C, Cabot. M.D.**

NOTES ON THE HISTORY

The two striking symptoms in the present illness are the nosebleeds and the trouble with her gums.

I do not see anything important that is added in the past history.

NOTES ON THE PHYSICAL EXAMINATION

"Increased breath sounds at the apices of both lungs" does not mean anything.

None of the examinations of the urine was made from a catheter specimen, and we have no reason to pay attention to them.

That blood is the interesting thing. There you have the old problem of a contradiction of reports. The report of achromia cannot be true if the hemoglobin is 40 and the reds 1,715,000. That is a very common contradiction. It has been my experience that when you have to beleive one of them it is better to believe the report of achromia in the smear, because the hemoglobin measurements are easier to make a mistake about. So I should believe that probably there was achromia even though the hemoglobin test is opposed.

"No reticulated cells." In a blood like this that is very important. It means that we have no evidence of regenerative effort in the marrow.

She certainly did not suffer for lack of donors and help on that side.

"Following the transfusion April 11 there was slight cough." Until now nothing has been said about cough, other than her brother's report about it.

"Quartz lamp treatment was started that day and given April 11, 19 and daily thereafter." I take it because they had no idea what else to do and thought they might as well take a chance with that.

These leucocyte counts are extraordinarily low. I do not remember having seen any lower than six hundred.

"Two days later the nosebleed recurred." So the treatment was not obviously effective.

DIFFERENTIAL DIAGNOSIS.

She certainly died of anemia. Our only possible point of discussion is its type or cause. In the beginning it seemed perfectly natural to suppose that this was an aplastic anemia. A profound anemia at her age and in her sex with hemorrhage, with low white count, with the absence of any known cause and of any signs of regeneration in the reds, is just the anemia that we call aplastic. But as we come to the examination of the mouth and parts around it there is a certain amount of evidence of infection. Could it be a secondary septic anemia? Then of course with this extremely high count of lymphocytes—high relatively, never absolutely—one thinks of leukemia; but I do not see why one should. What has happened is that the polymorphonuclears have given out; there is no increase of lymphocytes. They are proportionately numerous but not increased. The difficult thing is to call it a case of aplastic anemia with four and a half million reds which she had shortly before her death. We do not often see transfusions fill people up like that. She has had an extraordinary number of them. It might be that that would account for it.

She has had continuous fever, which would seem to favor infection; but any of the severe anemias may have fever.

She has had continuous fever, which would seem to favor infection; but any of the severe anemias may have fever.

I do not see that we have conclusive evidence of industrial poisoning. She worked in a rubber shoe factory. There are various substances to be thought of, especially lead and benzol. But we have no definite evidence of them here. I suppose they looked into this. If they have evidence we ought to have it. Working in a rubber factory does not prove poisoning.

DR. TRACY B. MALLORY: I think some additional information should be given there, Dr. Cabot. It is known that there have been seven almost exactly similar cases from this factory.

DR. CABOT: That certainly looks as if there were some definite industrial poisoning there, and of course we would thing of benzol rather than

lead. Benzol has a tendency to diminish the whites, as in this case. Lead has not.

A STUDENT: Is all this bleeding particularly characteristic of benzol poisoning?

DR. CABOT: It is characteristic of aplastic anemia; I do not remember having heard of it in relation to benzol. Of course if benzol hit the whites it would hit the platelets too, according to our present theory of their formation. And if it hit the platelets it would cause hemorrhages.

A STUDENT: How about the duration, Dr. Cabot? Isn't it short for aplastic anemia?

DR. CABOT: Four months? No, I should not say so. One of the characteristics of the disease is that it has a steady downhill course with none of the remissions that you get in pernicious anemia.

I think it is not a septic anemia. I believe it is either aplastic or due to benzol. I should think further knowledge in relation to that question would have to rest on further knowledge of the conditions under which she worked, with the possibility or probability of her having taken much benzol into her system. The story that we have of those other cases in the factory certainly favors benzol poisoning. I think on the whole if I had to bet I should say benzol now rather than aplastic anemia.

### ADDITIONAL NOTES

It was learned that the cement used by this patient in her work contained 80 per cent. of benzol.

A member of a commission for the investigation of benzol poisoning said in consultation: "The blood smear seems typical of benzol poisoning."

### CLINICAL DIAGNOSIS

(From Hospital Record)

Benzol poisoning.

### DR. RICHARD C. CABOT'S DIAGNOSIS

Benzol poisoning.

### ANATOMIC DIAGNOSES

Benzol poisoning.
Central necrosis of the liver.
Blood aspiration and bronchopneumonia.
Inactive bone marrow.

DR. MALLORY: The necropsy here is, as far as I know, fairly typical, of the usual findings in benzol poisoning. It is the first one that I have ever seen. At the time of necropsy the girls' weight had dropped to seventy-two pounds, although even then she did not seem very emaciated.

She showed the scars of at least eleven different incisions for transfusions.

She had a very definite jaundice which I understand developed during the last three days of life.

The peritoneal cavity showed about 5 cubic centimeters of fresh unclotted blood down in the posterior cul-de-sac, and the entire mesentery was peppered with minute petechial hemorrhages. The stomach showed a great many petechial hemorrhages in the mucosa.

The intestines were negative except for a staining of the mucosa of the ileum just above the ileocecal valve, which was dark reddish black, presumably another hemorrhage.

The pleural cavities both showed small amounts of blood-tinged fluid.

The lungs were rather interesting. The right apex showed an old fibrous scar, but no evidence of active tuberculosis. Around the scar was a consolidated bright red area 2 centimeters in diameter, obviously a fresh bronchopneumonia. The left lower lobe showed a more unusual picture. It was distended and one section was filled with numerous small, densely consolidated areas, firmer than bronchopneumonic patches, and a deep blackish red in color, more like infarcts. The outlines were sharp but irregular, in contrast to the usual smooth outline of infarcts of the lung. Microscopic examination showed that they consisted of aspirated blood, presumably from the hemorrhages in her nose or tonsils, with beginning infection around the edges of the areas. If she had lived a few more days they perhaps would have degenerated into abscesses.

The heart was very small. It weighted only 170 grams. The muscle tissues were soft and flabby. There was a very slight degree of arteriosclerosis.

The liver weighed 1220 grams. That is rather large in proportion to the size of the patient and the size of the remainder of the organs. Scattered throughout the tissue were many slightly yellowish patches each of which showed a minute hemorrhagic center, and microscopic examination confirmed the diagnosis of central necrosis, very widespread, which would explain the terminal icterus.

The spleen was not very remarkable in gross. Microscopically it showed a great deal of phagocytosis of the red cells and a great many endothelial cells filled with hemosiderin. That is characteristic of a toxic hemolytic anemia in contrast to familial hemolytic anemia.

The kidneys were negative except for a congenital anomaly of the pelvis on the left.

The bladder showed a few petechial hemorrhages.

The uterus was large. The cavity was filled with a large clot, and a still larger clot was expressed from the vagina.

The left ovary contained a large corpus hemorrhagicum.

The bone marrow of the rib was normal in appearance, red in color. The femoral bone marrow was bright yellow, also normal. Microscopic examination showed a purely fatty marrow in the femur with no evidence of regeneration. In the rib marrow red cells were still being formed. There were numerous normoblasts and occasional megoblasts. We found no megakaryocytes, which of course accounts for the low platelets, and no evidence of white cell formation.

DR. CABOT: If there had been no industrial history in this case would you not have had to call it aplastic anemia?

DR. MALLORY: I think so. Benzol poisoning is one type of aplastic anemia. I do not believe that there is any pathological difference that would justify one in making an absolute diagnosis of benzol poisoning. All that we can say is that it is consistent with it, and when we have a history like this there is no doubt about it.

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### CASE NO. 2

## (This is Case 13391, of the Case Records of the Messachusetts General Hospital, as published in Boston M. & S. Jour., of Sept. 29, 1927, p. 521, republished in May issue of this journal).

H. B. GUDGEL, M. D., Phoenix, Ariz.

## (Discussion before St. Joseph's Hospital Staff, Phoenix, on June 11, 1928).

The essential points in this history, rearranged for more convenient study, are as follows:

Nothing outstanding in the family history, except that one brother had rather frequent attacks of nosebleed, easily controlled.

**Personal History:**—Young girl, twenty years old. From childhood she had frequent nosebleed; at age of ten had influenza. Always fairly well but never rugged. Four years ago she came to a Massachusetts mill city from Canada. Weight at that time 122 lbs. About this time she complained of "growing pains" in the legs. One year before admission

to hospital she had abscess in right ear. Eight months before admission to hospital she began working in a rubber factory. Four months before admission she began to feel very tired at midday. Odors of cement nauseated her. Three months before admission she had a cold, which cleared up in two weeks, but she failed to gain strength, became weaker, lost interest in everything. Two months before admission she had nosebleed from right nostril, easily stopped. One month before admission her menstruation lasted three days longer than usual and was profuse. Two weeks before admission her gums on right and at back became sore and swollen. She became weak, tired, and was sent home to rest. April 6, day before entering hospital, bleeding from both nostrils with large clots.

**Examination:**—Pale, small (emaciated) girl, propped up in bed; breath very repulsive. Diffuse pigmentation of skin; many large purplish spots over lower extremities; tonsils inflamed; one hemorrhagic spot on hard palate. Extensive pyorrhea Heart slightly enlarged; systolic murmur at apex. Blood pressure 110/70, 100/82. Increased breath sounds at apex of both lungs. Abdomen and reflexes normal. Hazy left disc, especially on left nasal margin. Urine, 32 to 63 ozs., smoky, turbid, slight to heavy trace of albumen in four specimens; fifth specimen showed gross blood. (Vaginal bleeding which continued throughout stay in hospital). Sp. gr. of urine 1018 to 1014, red cells in three specimens, leucocytes in two. At entrance. blood showed marked leucopenia (1200 leucocytes. 16 per cent polys, 76 per cent lymphocytes. 8 per cent large mononuclears), hemoglobin 40 per cent, red cells 715,000; inequality of red cells, moderate achromia, platelets practically absent, no irregularity or stippling; clotting time 12 to 19 minutes. Wassermann negative. NPN 26 mgm. Gross blood in stools.

X-ray showed unusually small sinuses, antra slightly hazy, right mastoid cells not as clear as left.

Temperature 100. 3to 106.8; pulse 100 to 162; respirations 20 to 48. Platelets and reticulocytes diminished. Repeated blood tests showed slight rise in red count and an irregular falling in leucocyte count, 100 0on April 8, 600 on April 20; polys absent in two smears, one per cent in third. few in fourth; irregular in outline, vacuolated, coarsely granular.

I am to consider this case from a general clinical viewpoint, although the blood findings need to be mentioned. Some of the clinical manifestations do not coincide with the laboratory analyses, proving the necessity of knowing the blood findings which must form the basis of diagnosis in this case.

The general symptoms, as well as the blood findings, suggest some type of anemia. A young girl (20 years old), emaciated, pale, purpura on extremities with frequent hemorrhages, leucopenia, platelets decreased or nearly absent, relative lymphocytosis, hemoglobin 40 per cent, red cells one-sixth of normal, bleeding time 16 minutes, coagulation time 14 to 19 minutes, hemorrhages from mouth, gums and vagina, blood in urine and feces, irregular temperature. However, we find this case complicated, as is usually the case with anemias. We find pyorrhea, Vincent's angina, some increase in breath sounds in lung apices, slight enlargement of heart, a slight presystolic murmur at apex. As the result of some infectious focus, we very frequently find heart murmurs varying from slight to distinct, variable temperature, loss of energy and appetite, albumen in urine, with a terminal secondary anemia. In all cases of anemia focal infection must be looked for and considered. In the case report mention is twice made that patient became nauseated and very weak each day on account of the odor of cement used in the rubber factory where she was at work. This would suggest a possible hemolytic anemia as the result of coming in contact with certain chemicals of the coal tar group.

Anemia from malignant disease can be fairly well ruled out.

Renal disease is capable of producing anemia. In this case, albumen is present, probably the result of blood in urine and not the result of nephritis. Neither history nor laboratory findings suggest such a diagnosis.

Hemophilia, or Bleeder's Disease, finds some suggestion in the symptoms. Epistaxis was present in early life; also one brother had frequent nosebleed. Epistaxis, to my way of thinking, is not a dependbale sign of hemophilia, and the rule for hemophilia (through mother to son) is dependable. The blood findings of hemophilia would be those of hemorrhage, and directly opposite to those found in this case.

Purpura hemorrhagica needs to be considered because of the hemorrhages from mucous membranes and into the skin. These purpuric spots appear to have come suddenly, on the extremities and hard palate, and in conjunctiva, all areas consistent with purpura hemorrhagica. Leucocytosis is a differentiating symptom, not present here.

The hemolysis produced by focal infection, pyorrhea and Vincent's would give an anemia similar in symptoms, but would probably show the blood picture of a secondary anemia different from this case.

Secondary and hemolytic anemias are very easily confounded with the anemia of tuberculosis, especially in the later stages of this disease, when the anemias of the secondary type. Clinically it is necessary to rule out tuberculosis, because this girl was never rugged, has been pale, weakly, with irregular temperature, some increase in breath sounds over apices, hemoptysis, etc. The anemia is not that of tuberculosis.

There are some evidences of chlorosis, green sickness. This is a young woman, living away from home, probably not under the best conditions, with loss of energy, unusual fatigue, hemorrhagia, nervousness, depression, pale mucous membranes, facial pallor and dyspnea. Greenish skin is not a common symptom of chlorosis, pallor being the rule. The blood findings of chlorosis with its striking achromia, increase in platelets and reticulated cells and leucocytosis, are absent in this case.

With the symptoms which have been named and the blood picture (leucopenia, extreme decrease in red cells, absence of platelets, hemoglobin 40 per cent, relative lymphocytosis, moderate achromia) we must think of pernicious anemia of the aplastic type. This may have been superinduced by secondary or hemolytic anemia, as the result (a) of some focal infection, or (2) coming in contact with some chemical substance in the manufacture of rubber. The changes in bone marrow and blood in aplastic anemia are very insidious, causing delavia in early symptoms, the changes usually being far advanced before troublesome symptoms arise. The gradual loss in strength, the fatigue, the striking pallor, dyspnea, are symptoms coming late.

HARLAN P. MILLS, M. D., Phoenix, Ariz.

## (Discussion of blood picture, Case 2, before St. Joseph's Hospital Staff Meeting, June 11, 1928.)

The blood picture is well defined and quite characteristic, and was evidently considered of significnace in the study of this case, as examinations were made at frequent intervals. The important features of the blood picture are the low red

count, leukopenia with low percentage of polynuclears, and the entire absence of immature red cells. The red count on entrance was 715,000 with hemoglobin 40 per cent, giving a color index of 2.8, which is hardly consistent with the record that "moderate achromia" was present. After many transfusions the red count increased to six times the count on entrance, while hemoglobin increased two times from the findings on first examinatoin. The high lymphocyte percentage is evidently a relative increase on account of the very low percentage of polynuclears. The statement made repeatedly of "platelets practically absent" or "greatly reduced" is of significance in diagnosis. After repeated transfusions, the red count and hemoglobin rose steadily until, a few days before death, there were over four million reds with hemoglobin 80 per cent. Coincident with this rise in reds and hemoglobin, there is a continuous decline in leukocytes, as low as 400 being recorded, the polynuclears constantly reduced and absent on some examinations. This also is an important diagnostic finding. Blood platelets and reticulocytes remained reduced.

The blood findings in this case record are practically diagnostic so far as the location of the essential lesion, which evidently involves the blood-forming function of the bone marrow, which is to produce red cells, platelets and polynuclear cells. The prominent clinical feature of the case, i. e., multiple hemorrhages, are no doubt secondary to blood platelet reduction. As to origin the condition may be idiopathic, or, as more probable in this case, the result of a chemical poisoning, associated with the patient's occupation.

My diagnosis is aplastic anemia, with secondary purpura hemorrhagica. This condition must be differentiated from purpura hemorrhagica with resulting anemia. In purpura hemorrhagica we would expect the blood changes characteristic of hemorrhage: reduced red count and low hemoglobin, but in severe cases nucleated reds and other immature cell forms would be present and there should be leukocytosis instead of leukopenia. Blood platelets would be absent or greatly reduced and the coagulation and bleeding time lengthened. Absence or reduction of circulating blood platelets results from destruction or depressed activity of the megakaryocytes of the bone marrow resulting from benzol or other poison or from certain toxins. This action on the function of the bone marrow may extend to and inhibit other activities beside platelet formation, as red cell and polynuclear cell formation, as is well illustrated in the case under discussion.

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## NEWS ITEMS

Dr. Charles Thompson of Pueblo, according to the Santa Fe New Mexican, was in Santa Fe recently looking over the country in that region with the idea of establishing an institution for the care and treatment of nervous and mental diseases. Dr. Thompson has had charge for a number of years of "Woodcroft," an institution in Pueblo devoted to these diseases and as he has sold out there he is looking for another location.

The semi-annual meeting of the Arizona State Board of Nurse Examiners was held at the Grand Canyon, June 12 and 13. At the meeting of the board, certificates for entry into the practice of professional nursing in the state of Arizona were issued to 19 applicants, who passed the state examinations.

Though 29 took the nursing examinations, only 19 received a passing grade, and were awarded certificates. Highest grades were made by Miss Charlotte Harrington, of St. Joseph's Hospital, and Miss Florence Linderman and Mrs Helen Irene Upp, of Good Samaritan.

Thirty-seven certificates were issued to nurses from 18 states changing residence. The board revised the ruling regarding the issuance of permits to practice professional nursing in Arizona pending registration, and the renewal of the annual fee has been changed to read as follows: The length of time of permit shall be for two months, and at the end of that time, it must be renewed, when an extension of 30 days will be allowed pending delay of application of registration. If application and credentials are not in possession of secretary-treasurer, accompanied by the registration fee, the candidate may be considered ineligible for registration in Arizona and permit withdrawn.

The Arizona State Board of Health has done considerable work in inspecting the tourist camps of Arizona. This work was first started by Miss Jane Ryder in 1925. We understand that those camps which meet the approval of the inspector are given signs reading: "Approved Tourist Camp—Arizona Board of Health." The report is that there has been a definite improvement in the sanitary features of many of the camps since the inspection has been started.

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The Cochise County Medical Association had as a program an operative clinic by Drs. E. W. Adamson and H. M. Helm. Previously operated cases were also shown.

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Dr. A. A. Shelley, Heard Bldg., Phoenix, Ariz., is in St. Louis taking a post graduate course at the Washington University of St. Louis in obstetrics. He writes that he has had a particularly satisfactory course. He will return home early in July.

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Dr. O. H. Brown attended the A.M.A. meeting in Minneapolis. He gave a paper on the Theory, Etiology, Symptoms and Treatment of Food Sensitizations, for the Society of the Study of Allergy He also discussed Dr. A. H. Rose's (San Francisco) paper on Food Sensitizations before the section of therapeutics and pharmacology of the A.M.A.

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Dr. R. D. Kennedy of Globe attended the A.M.A. meeting in Minneapolis and served the Arizona State as its delegate. He gave a clinic on fractures.

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Dr. Collander of Tucson attended the A.M.A. meeting in Minneapolis.

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Dr. Dudley Smith, Proctologist of San Francisco on his return from the meeting of the A.M.A., stopped over in Phoenix to visit his nephew, Dr. Willard Smith. He attended the regular June meeting of the staff of the Good Samaritan Hospital, and spoke upon the subject of rectal and colon diseases.

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Dr. W. W. Watkins is spending the month of July away from Phoenix. He will first go to Oak Creek Canyon and then to the coast.

# Southwestern Medicine

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## COMMITTEE ON COST OF MEDICAL CARE

In May 1927, ten physicians—three of whom were private practitioners—three economists, and three non-medical persons engaged in public health work, organized "The Committee on the Cost of Medical Care." The committee has since been enlarged. It has affiliation with no other organizations: i. e. to say it is not being sponsored or governed by any heretofore existing organization. It has the support and encouragement of numerous organizations.

A five-year program has been laid out, in which all phases of the question bearing upon the cost of medical care to the public are to be investigated. Quoting from one paragraph of the committee's literature: "The committee will deal not only with the cost to the people of hospital care, nursing, dentistry, drugs, physiotherapy, surgery, and other medical services, but with various problems involved in the prevention and cure of disease. The demand for medical services and their supply and distribution is the subject of a preliminary survey. The major group of studies deals not only with the cost to the family, but also with the return accruing to the physician, the nurse, the dentist, and other agents furnishing such services.

The American Medical Association is to conduct a survey of the incomes of physicians. Other organizations are to cooperate in other investigations.

The literature of the committee contains a quotation from a discussion in 1922 of the Journal of the Michigan State Medical Society which apparently puts into words the impetus for the origin of the committee. The quotation follows: "The tendency of the day is that when any group of citizens cannot afford to purchase certain privileges, services or needed comforts the demand goes forth that the state supply them that which they cannot now obtain. The state and county usually comply with the pressing demand of its citizens. We are fearful that we are on the eve of such a demand from the people. What are you going to do about it?"

Another paragraph is worth quoting: "During the past decade or two, there have been other warnings and questions, like these, but no effort has been made by medical organizations to meet the problem. It was not reasonable to expect them to do so. Private practitioners are absorbed in the technique of treatment. It is extremely difficult for them to see the problem as a whole. The points of view of public health and economics, combined with the point of view of private practice, are needed. These are all found in the Committee on the Cost of Medical Care. The interests of the private practitioner will be adequately represented and safeguarded as the work of the committee develops."

We have presented the subject succintly but we trust clearly. Comment is reserved for a later issue.

## EXAMINATIONS FOR MEMBERS OF SPECIAL SCHOOLS OF HEALING

An initiative petition, bearing a necessary number of signatures to place it upon the ballot this fall has been filed with the secretary of state, and reads as follows: "Amendment to the Constitution of the State of Arizona. Be it enacted by the people of the State of Arizona: That the Constitution of the State of Arizona be and is hereby amended by adding thereto another

section to Article II. Declaration of Rights; the same to be number 35, and to read as follows, towit: Section 35. No law shall be enacted in this state respecting the establishment of any method of healing, or prohibiting the free exercise of the right of any person to choose any method of healing, or that will compel any healer to be examined by a board of examiners which is not entirely composed of his or her school of healing. All legislation conflicting with this amendment is hereby repealed."

This measure is worded and designed to appeal to the layman who is overly jealous of his personal liberty and rights. A study of the full meaning of the text of the petition, however, will convince any thinking person that the enactment of this into an amendment to the constitution will throw down the bars for admission to practice in the state to all sorts of irregulars and poorly trained members of any school of healing.

**Those who practice any method of healing might have noncontents and ignorant persons, unable to pass the examinations prescribed, who would withdraw and set up their own and an independent school of healing; under this amendment they would be their own judges as to their fitness to practice upon the sick of the state.**

On this course of reasoning it is easily seen that the amendment is pernicious and would defeat much of the purpose for which it is planned.

Those who have loved ones and who think the best is none too good for them, will not wish to see requirements for practice of the healing art in the state made any lower than they are at present. The amendment would cause a great increase of suffering and a tremendous increase in the public's financial burden for illness.

**If this petition becomes an amendment to the constitution there will be no easy way to remove it and no way whereby laws could be passed to properly control those who administer to the sick.**

Every person interested in the welfare, of our state should work against and vote against this proposed amendment.

Arizona doctors! tell each patient and friend you meet the importance of voting NO on Initiative Petition Nos. 100 and 101.

## INTERSTATE POST-GRADUATE ASSOCIATION WILL MEET IN ATLANTA

For the first time in the South there will meet a medical association whose procedure is unique and of remarkable interest.

The Interstate Post-Graduate Medical Association of North America will meet in Atlanta, Ga., October 12th to 19th inclusive. This association in 1926 met in Cleveland, Ohio, where nearly 5,000 practicicing physicians were registered. At the Kansas City meeting last October 5,200 were registered.

Those who come to this remarkable sort of medical meeting will really be given a post-graduate course by the leading medical men of this country and abroad. The daily meetings are held from 7 A.M. to 1 P.M., from 2 to 5 P.M. and from 8 to 10 P.M. Every one who has attended these meetings has been amazed by the magnitude of the work done, by its quality, by the number of distinguished guests and by the remarkable interest aroused.

It is hoped that every physician in the Southern States who can possibly do so will plan now to attend this meeting. The only charge imposed on physicians who are in good standing in their county, state and national organization is a registration fee of $5.00.

## NEWS ITEMS

Dr. A. E. Cruthirds specializing in eye, ear, nose and throat work in Bisbee has moved his offices into the building formerly occupied by the Antlers Hotel. The new quarters affords the doctor ample room.

The Douglas, Ariz., City Health Board under the supervision of City Health Officer Causey is starting this month a systematic collection and disposal of garbage.

The Northern District of the Arizona State Medical Association met at Flagstaff, June 16th. The program consisted of an address by the President of the Arizona State Medical Association, Dr. A. C. Carlson, on the subject of The Workmen's Compensation Act, a paper by Dr. R. J. Dostal, on Bone Cysts and a paper by Dr. (dentist) Vaughn S. McGuire on Relations of Physicians and Dentists. Ten physicians and dentists enjoyed the program.

Dr. C. B. Austin, Hidalgo County, New Mexico, Health Officer vaccinated about 100 persons in his county who were possibly exposed to small pox in Duncan, Arizona, with the result that no cases of the disease appeared in his county.

The Arizona bureau of child hygiene reports that for the past year it has reached 1100 infants under one year of age, 1600 pre-school children and 355 prospective mothers. The number of births in the state for the year was 8626. Physicians conducted 33 health conferences examining 700 infants and pre-school children. Nurses conducted 23 conferences inspecting 248 children. Nurses also visited 4250 homes giving instruction in maternal, and child care. Dentists conducted nine conferences giving dental advice to 350 children.

It is reported that a certain small hotel between Gallup and Albuquerque recently had a waitress to develop typhoid fever; her husband is a cook. Three other waitresses and the assistant cook are not feeling well. Health examinations of restaurant employees and a free use of anti-typhoid inoculations are indicated.

## OBITUARY

### JOEL IVES BUTLER.

(Copied from Tucson Newspaper)

The following tribute to the dead physician was written by Dr. William V. Whitmore, colleague of Dr. Butler for many years:

This community has not recovered from the shock of the death of Dr. Butler, which occurred in the early morning of last Thursday, June 28, 1928, in Los Angeles. He had gone there several weeks

before. The profession knew of his serious illness, but was wholly unprepared for his untimely demise.

Dr. Butler come from sturdy New England stock. He was born in Meriden, Conn., where his ancestors had been residents for many years.

Probably no man ever came to Tucson—very few to Arizona—better equipped for the practice of medicine than Dr. Butler. He had a broad general education, being a graduate of Yale—Ph. B. '97. He supplemented his medical course at Johns Hopkins by an internship at that hospital for two years. This was followed by one year as house surgeon at Massachusetts General hospital, Boston. Upon removing to Tucson, he surrendered his assistant professorship in surgery at Yale Medical College.

He came to Tucson 16 years ago. Soon thereafter, he with Drs. Clyne, Huffman and Whitmore, took over the Rodgers hospital, which they conducted for some seven years. Dr. Butler was president of the corporation, manager and superintendent of the hospital for seven years.

His unusual ability was at once recognized, his counsel was sought and his skill utilized. His outstanding prominence in Tucson soon made him known throughout the state and the entire southwest. He was early elected president of the Medical and Surgical Association of the Southwest—a distinction that has fallen to no other Tucson physician. He was a Fellow of the American College of Surgeons and was captain in the medical corps, 1917-1918.

His interest in his chosen work was distinctly professional and scientific than merely commercial. To those who could and should pay, he displayed a commendable persistency. But he would spend days—if necessary—ferreting out obscure cases, when he knew not only that there would be absolutely no remuneration, but that the costs for necessary laboratory tests—freely ordered—would fall upon him. He was a natural investigator—a most valuable man for any group or community. His professional life, covering a period of 27 years, was one that all of us might envy.

He held high the standards and reputation of the profession. His competitors knew that he would never take the least advantage of them in any way. In fact, he would go out of his way to prevent an injustice being done to others. He had very little patience with those who "cut across corners" in the matter of ethics.

He had a large and loyal clientele. The most of his patients considered him not only a trained and successful medical and surgical advisor but an intimate personal friend as well. He had the happy faculty of meeting and mingling with people. He probably had a wider general acquaintance than any of the profession in Tucson.

His most outstanding traits of character seemed to be his innate honesty and absolute sincerity. No one needed to accept his views in toto, to be profoundly impressed by these qualities. He acted upon his convictions.

While a busy man, yet his interest and activities were not confined solely to his profession. He was a loyal, enterprising and substantial citizen—interested in every measure that might benefit the community. Especially did he have a genuine interest in education and educational institutions.

The Tucson medical fraternity has in the past suffered the loss of able and prominent members. Quite a number of such have met sudden death by accident. Several have had very brief acute ailments. But for months Dr. Butler's critical condition has cast a gloom over the entire profession, especially his more immediate associates. To my knowledgde, nothing has approached this in 35 years. We have not been ourselves.

To the younger members of the profession, particularly, Dr. Butler's thorough preparation for, and devotion to, his profession; his unquestioned honesty, sincerity and integrity; his unusual fairness and squareness; his extreme friendliness and readiness to assist a fellow practitioner, as well as his record as a courageous and valuable citizen—all this should serve both as a worthy example for emulation and a source of inspiration.

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## DR. ALBERT E. LAUSON

Funeral services for Dr. Albert E. Lauson, 60, who died at the family home in Anthony, Tuesday afternoon, will be held at the Peak-Hagedon chapel Thursday at 10 a. m. The Rev. C. A. Twining will officiate.

Dr. Lauson had been ill for about a year. Born in Galesville, Wis., he received his early education in Valparaiso, Ind. He graduated from the College of Physicians and Surgeons in Chicago, earning his own way through the institution. For 12 years he was an instructor of anatomy in the Milwaukee College of Physicians and Surgeons.

He also was a practicing physician in Milwaukee until his health failed. In 1904 he moved to the valley and located at Anthony. During his long residence there he took an active part in all movements for the improvement of the community.

Surviving him are his widow, Mrs. Gertrude V. Lauson, and a daughter, Helen C. Lauson, both of Anthony.

(El Paso Herald)

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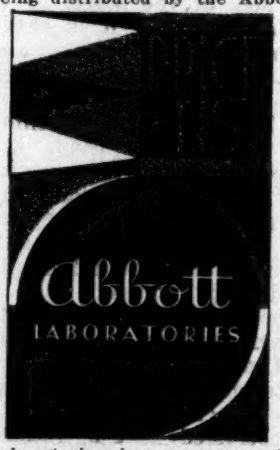
## NEW ABBOTT-D.R.L.-MILLIKEN PRICE LIST

One of the most handsome and modern price lists ever published by a pharmaceutical house is now being distributed by the Abbott Laboratories.




This list, beautifully designed and printed in attractive colors, contains 176 pages. Included in this price list, will be found not only the principal products of the Abbott Laboratories and the Dermatological Research Laboratories but also a list of the most important preparations of the house of John T. Milliken & Co. of St. Louis, which was acquired by The Abbott Laboratories on January 3, 1928. With the addition of this line The Abbott Laboratories is now prepared to supply standard pharmaceuticals of the finest quality, as well as the fine chemical and other specialties which have been the distinguishing feature of this house.

The Great War led to a radical change in The Abbott Laboratories. For some years prior to 1916, a limited amount of research had been conducted, and a few chemical products were manufactured in its Ravenswood plant. The nucleus of a real chemical staff had been assembled. In 1916, Dr. H. D. Dakin, an English Chemist, co-operating with Dr. Alexis Carrel, in France, in the study of septic wounds, discovered the remarkable germicidal power of the chloramines. His paper was published in the British Medical Journal. This led to the manufacture of Chlorazene by The Abbott Laboratories—the first firm to produce and introduce this substance in America. Soon after followed Dichlora-

mine—T and Chlorcosane, also developed by Doctor Dakin. These three substances are now official.

Since then The Abbott Laboratories has taken front rank in research in synthetic medicinals. When we entered the war, it was assigned the task of producing some of the more important medicinals heretofore made only in Germany, such as Barbital, Procaine and Cincophen. Soon it added Anesthesin, Acriflavine, Neutral Acriflavine and Neocinchophen. From the very beginning of its venture into the chemical field, original research, looking to the discovery of new and valuable products, has been part of the program of the house, and the result is the introduction of a number of valuable new synthetic drugs, among them Butyn, Butesin and Butesin Picrate, Neonal and Metaphen.

In the hands of The Abbott Laboratories and under the direction of Dr. George W. Raiziss, the "D. R. L." has made steady progress, not only in the production of large quantities of the arsphenamines of constantly improving quality; but also in fine research leading to the creation of valuable new synthetics, such as Metaphen, Bsimarsen and Sallexin.

Still another forward step was the moving of The Abbott Laboratories from Ravenswood, in Chicago, to the splendid new plant, consisting of a group of fourteen buildings on a tract of twenty-five acres, located at North Chicago, Illinois.

The latest step forward is the acquisition of Milliken, already referred to. Milliken products have an excellent reputation, which will be enhanced by the Abbott policy of backing its preparations by constructive research, looking toward constant improvement—the abandonment of things that are weak or useless, and insistence upon bringing the line into accord with the changing spirit of the times. Abbott gives this assurance to its friends that in broadening the base upon which its business structure rests, by the addition of a general line, it is going forward, not backward. The fundamental policies of the house will be adhered to for the evolution of better as well as bigger things.

The Abbott Laboratories is built upon research, and greater pride is taken in the scientific achievements of the house than in its financial success. As stated by the President of the firm, Alfred S. Burdick, M. D., "We believe that the future of this institution must rest upon sound scientific work. Our policy, therefore, may be epitomized as follows:

1. Research is fundamental and vital. Without it real progress is impossible—in spite of occasional evanescent success.

2. Research in a business organization should be co-ordinated with research in our universities, hospitals and other institutions.

3. Specialize. This means the direction of intense effort into certain important channels. The result should be the evolution of real specialties of outstanding merit, which will achieve and deserve success.

4. Anticipate the currents of thought by watching the trends. Never in the history of medicine has there been such a ferment of intellectual activity. Look ahead. Encourage those about you to do this.

5. Work with others—and particularly with the leaders in the medical profession and the industry. Don't resent adverse criticism. If it is sound, bring yourself into line.

6. Advertise. If a product possesses outstanding merit, don't grudge the money necessary to bring it to the attention of prospective users."

A copy of this new Price List may be obtained by addressing The Abbott Laboratories, North Chicago, Ill.

## AN INTRODUCTION TO GASTROENTEROLOGY

by Walter C. Alvarez, M.D., Associate Professor of Medicine, University of Minnesota (The Mayo Foundation); with 100 illustrations; Second Edition; Paul B. Hoeber Inc.; New York; 1928; $7.50.

Many physiological problems should be worked over from all experimental aspects with the advantages of modern technic and modern conceptions. Dr. Alvarez is doing this for the mechanics of the digestive tract. This is a subject that was once regarded as nearly settled and stable. Alvarez's work, however, shows definitely that we must adjust our conceptions of many of the more important mechanical functions of the digestive tract; some of our older ideas are simply established with greater permanency through his researches.

One conception which, apparently, makes little difference to the clinician but on which most of us have been in error, is that the initiation of the intestinal contractions are in muscle tissue rather than in nerve. We must establish in our minds the concept of a gradient, and then apply it to various parts of the alimentary tract. The engineers have made free use of the term gradient, and it seems perfectly natural that it should be applied to physiological questions.

An incline is a gradient. A pyramid wall is a gradient. The business of a corporation or physician increases year by year: the graph which might be constructed to indicate the gradual increase would be a gradient. A gradient may be up or down, of any per cent. So many things go by gradients.

Applying the gradient idea to the alimentary canal: The contraction waves of the upper part of the bowel, says Alvarez, are more frequent and stronger in the jejunum than in the ileum. There is probably a more or less gradual gradient of the activity from the upper part of the small bowel down to the lower part of he small bowel. This is necessary, it is easy to see, for the passage of material in the correct direction through the intestines. Probably the same principle applies to the fundus of the stomach, to the pars pylorica and to the colon. The pacemaker in each of the divisions named above is probably in the muscle anatomically nearest the mouth.

Another than the normal area of any part may become pacemaker for a time by virtue of one or another type of irritation. A peristaltic wave may arise at a lower part of the intestine; it travels in both directions; but normally it is more effective in the downward than in the upward direction. In case of obstructions or interferences in the passage of the fecal matter, the upper peristalsis may become hyperactive and may lead to a development of nausea and vomiting.

Alvarez's work upsets another old idea by showing that, in a large percentage of the cases of constipation, the bulky diet is incorrect treatment; it should be bulkless instead. Fluid material passes down the bowel much easier than do the solid masses, and will often pass along leaving the masses behind.

Dr. Alvarez is an enthusiast. Otherwise he could not and would not have done the work he has. Any book of 450 pages requires a tremendous amount of work; one having a large bibliography to which frequent references are made, means a still greater amount of work; add to this an endless amount of laboratory experimentation and clinical investigations of the most painstaking sort and, if one has a good imagination, he may be able to realize the colossal task the author has performed. Such a work is an oasis of delight in the reviewer's work.

There are 50 pages of bibliography, and every

page of the text has many references to the literature. The author has attempted to include all the gastrointestinal literature. The text is a report of the author's researchs in the literature, clinic and laboratory. He advances theories when obliged to do so to make clear the explanation of his findings. Unquestionably, Dr. Alvarez will be wrong in some of his contentions—every enthusiast is. It is thoroughly evident that the author knows this and is not afraid to change when proved wrong. In the main, however, the findings and conclusions are rational, and will doubtless be further substantiated.

There are many suggestions, regarding therapy of various and sundry pathologic conditions of the alimentary tract, with which the clinician should familiarize himself. They are often diametrically opposite to the old conceptions which have, all too often, been tried and found wanting.

The pictures of many leaders who have contributed to the science of gastroenterology form an attractive feature of the book. The author has a clear, concise style, rarely using more words than is necessary. There are places, however, where a careful critic would have cut out certain unnecessary words. For example: In the first line of the preface to the first edition, the word "some" in no wise strengthens the sentence. There are relatively few similar instances.

There is the usual error of using the word "people" where the word "persons" seems preferable; and in a number of places the word "or" is used where "to" is plainly meant. For example: On page 159, the 4th line from the top, there is the expression "10 or 20 years" where, clearly, "to" in place of "or" would be the accurate expression.

The reviewer found no misspelled words. The work of the publisher is painstaking and up to the usual Hoeber standard.

Any clinician intrested in gastroenterology will find valuable suggestions and unlimited enthusiasm from a reading of the book. I recommend it for a position upon the physician's five-foot bookshelf—which should be just far enough away to be reached by the outstretched right (either is right) hand.

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## THE NEW MEXICO MEDICAL SOCIETY
## Forty-Sixth Annual Meeting, At Albuquerque, N. M., May 10-12, 1928

### MAY 10, 1928

The fifty-sixth annual session of the New Mexico Medical Society, held at Albuquerque, N. M., was formally opened at 8 a. m. on Thursday, May 10, 1928, when a meeting of the Council was called to order by the President, Dr. C. B. Elliott (Raton), in the assembly room of the Alvarado Hotel.

There were present: Ex-officio members: Dr. C. B. Elliott (Raton) and Dr. L. B. Cohenour (Albuquerque), president and secretary-treasurer respectively of the Society; and the following members: Dr. C. Mulky (Albuquerque); Dr. R. C. Brown (Santa Fe) and Dr. W. T. Joyner (Roswell).

The financial report of the secretary-treasurer was presented and read by him and approved, as follows:

Gentlemen: I herewith submit a report of the financial affairs of the New Mexico Society for the term ending this date:

**Receipts:**

| | |
|---|---|
| Cash on hand and received from Dr. C. M. Yater,, May 18, '27 | $ 424.05 |
| Delinquent dues from eleven members for year 1927 | 55.00 |
| Annual dues for 1928, 206 members | 1030.00 |
| TOTAL receipts | $1509.05 |

**Disbursements:**

| | |
|---|---|
| Reporter for 1927 meeting | $ 144.00 |
| Secretary's salary, 1927 | 300.00 |
| Southwestern Medicine | 448.00 |
| TOTAL disbursements, by Dr. C. M. Yater | $ 892.00 |
| Treasurer's bond for 1927 | 5.00 |
| Southwestern Medicine for eleven members | 22.00 |
| Reimburse Dr. Cohenour for express charges | 3.22 |
| Radio Supply Co. (filing cabinet etc.) | 49.35 |
| Stationery and supplies | 42.50 |
| Lewis Printing Co. (500 stamped envelopes) | 13.50 |
| Directory of American Medical Ass'n. | 12.00 |
| Lewis Printing Co. (250 membership cards) | 3.75 |
| Reporter of State meeting, advanced half of fee | 75.00 |
| | $ 226.32 |
| Balance, cash in bank on this date | $1282.73 |

**Outstanding Indebtedness:**

| | |
|---|---|
| Southwestern Medicine (dues for 206 members for 1928) | $ 412.00 |
| Secretary's salary for 1928 | 300.00 |
| Reporter for 1928 meeting—balance of fee | 75.00 |
| Medical Directory for 1928 | 12.00 |
| Treasurer's bond for 1928 | 5.00 |
| Approximate total | $ 804.00 |

Respectfully submitted,
(Signed) L. B. COHENOUR,
Secretary-Treasurer.

Dr. Cohenour submitted the application of Dr. C. H. Gillenthein, Valmoro, N. M., for membership in the society, which was referred to the Board of Censors with recommendation for favorable action.

No further business coming before the meeting, adjournement followed at 9 a. m.

**House of Delegates**

Immediately after adjournment of the Council, a meeting of the House of Delegates was called to order by President Elliott, the following members responding to the roll-call:

Bernalillo County—Drs. L. B. Cohenour, C. Mulky and E. C. Mathews (all Albuquerque).

Chaves County—Dr. W. T. Joyner (Roswell).

Colfax County—Dr. C. B. Elliott (Raton).

Dona Ana County—Dr. Dwight Allison (Las Cruces).

Santa Fe County—Dr. R. C. Brown (Santa Fe).

Union County—Dr. C. F. Milligan (Clayton). (Representing Dr. J. P. Powell). Later, Dr. J. P. Powell.

Report of the secretary-treasurer, Dr. L. B. Cohenour (Albuquerque), was read and approved, as follows:

House of Delegates,
New Mexico Medical Society,
Albuquerque, N. M.

Gentlemen:- I hereby render a report of the affairs of the office of Secretary-Treasurer for the term ending with this session

At the last meeting, held at Carlsbad, N. M., May 9, 1927, there were several members suspended for non-payment of dues and, immediately following this, eleven were reinstated.

Members in the Society at this time are as follows:

| | |
|---|---|
| Bernalillo County | 39 |
| Chaves County | 18 |
| Colfax County | 16 |
| Curry County | 9 |
| Dona Ana County | 13 |
| Eddy County | 11 |
| Grant County | 12 |
| San Miguel County | 8 |
| Luna County | 5 |

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# HAYFEVER

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**GRASS HAYFEVER** begins about the time *tree hayfever* ends, *viz.* May 15th, and need not be confused with the earlier appearing and sometimes overlapping tree hayfever.

**WEED HAYFEVER**—August to frost—is unrelated to the previously occurring *grass hayfever* and is occasioned, according to the locality, by such late pollinating plants as the Ragweeds—Russian Thistle—Western Water Hemp—Carelessweed—or Sage Brush.

**LIST** of pollens for any section—any season—with commentary circular discussing the treatment of hayfever by *preseasonal* or *coseasonal* method, with respective schedules of dosage—sent on request.

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McKinley County ..... 16
Santa Fe County ..... 20
Union County ..... 11
Members at Large ..... 41
Total in good standing on this date ..... 206

One application for membership was received. This shows a loss of 19 members since the last report—due to the following reasons: Death, 6; non-payment of dues, 13.

The following members have died since the last report was made:

Dr. Malcolm Montgomery Crocker, Lordsburg, N. M. May 17, 1927, perforated duodenal ulcer.

Dr. W. T. Murphy, Albuquerque, N. M. May 16, 1927, pulmonary tuberculosis.

Dr. F. F. Fadeley, Virginia. Oct. 4, 1927, carcinoma of rectum.

Dr. D. C. Dodds, Albuquerque, N. M. Dec. 16, 1927, cerebral hemorrhage.

Dr. J. A. Massie, Santa Fe, N.M. Feb. 21, 1928, heart disease.

Dr. O. R. Haymaker, Roswell, N.M. February, 1928, following operation.

Dr. M. D. Welsh, Dawson, N.M. March 1, 1928.

Dr. J. B. Hughes, Anthony, N.M. April 3, 1928.

Respectfully submitted,
(Signed) L. B. COHENOUR,
Secretary-Treasurer."

The minutes of the Council meeting held on May 10, 1928, were read by the secretary, and approved.

The application of Dr. C. H. Gillenthein, Valmoro, N.M., for membership in the Society, was presented, with recommendation of the Board of Censors that it be approved. The application was favorably passed by unanimous vote.

The question of physicians' group liability insurance, which was referred to a committee for investigation and report, at the meeting last year, was brought up for discussion, Dr. Mulky, a member of the committee, reporting that the matter had been gone into thoroughly and, after much discussion with insurance representatives and correspondence, the proposition submitted by the United States Fidelity and Guaranty Company, Denver, Colo., seemed to offer the most reasonable and best inducements.

The Secretary read a letter received from said company, which quoted the following rates:

$ 5,000-$15,000 limits—

| | | | |
|---|---|---|---|
| Minimum, | 25 men, | cost | $22.50 |
| Minimum | 50 men, | cost | $20.00 |
| Minimum | 100 men, | cost | $17.00 |

$10,000-$30,000 limits—

| | | | |
|---|---|---|---|
| Minimum | 25 men, | cost | $27.50 |
| Minimum | 50 men, | cost | $25.00 |
| Minimum | 100 men, | cost | $20.00 |

After considerable discussion pro and con, motion was made by Dr. W. T. Joyner (Roswell) that further action be postponed until the next meeting of the House of Delegates, at which it was anticipated there would be a larger attendance. The motion was seconded by Dr. R. C. Brown (Santa Fe) and carried.

The secretary read a telegram of felicitation and good wishes from the Iowa State Medical Society in annual session.

The secretary was instructed to send an appropriate telegram in reply.

The president appointed the following committees:

Necrology: Dr. L. B. Cohenour, (Albuquerque), Dr. R. C. Brown, (Santa Fe), Dr. C. F. Milligan, (Clayton).

Resolutions: Dr. W. T. Joyner, (Roswell), Dr. Dwight Allison, (Las Cruces), Dr. J. P. Powell, (Clayton).

Adjournment followed at 9:45 a. m.

**General Assembly**

The session of the General Assembly was called to order by the president, Dr. C. B. Elliott (Raton). The room was well filled when the session opened, approximately seventy-five physicians having already registered at this time.

After the invocation by Dean H. R. O'Malley, of Albuquerque, Dr. P. G. Cornish, Jr., president of the Bernalillo County Medical Society, welcomed the visiting physicians in a few choice remarks: "Mr. President and Members of the State Medical Society: Albuquerque is always glad to entertain any of the medical profession. In behalf of the Bernalillo County Medical Society I want to extend our best welcome to you. We hope that if, at any time, you need assistance in amusing yourselves, or if there is anything at all that you want to see, or any place that you want to go, you will feel free to call upon any of the members of this Society and ask them for anything you want. The Bernalillo County Medical Society is more or less working out at this meeting for a large Southwestern meeting which we hope to have here in November and we want you all to have a good time, enjoy yourselves, and come back in the fall to that meeting."

Dr. Dwight Allison (Las Cruces), in response, stated: "We are very glad to come to Albuquerque. We always enjoy seeing you; your welcome is always spontaneous. We always have a good time when we come here and I notice that the attendance is always a little better when our meetings are held here than it is anywhere else in the State. That shows our appreciation and I hope we will show you by our presence here in November, how much we appreciate the invitation to attend the Southwestern meeting."

President Elliott, in introducing President-Elect Dr. T. P. Martin, said: "We are very fortunate indeed in the man selected this year for president. He is a man who is not only thoroughly known throughout this state, but is known throughout other states as well. He is from the town in this state that has the distinction of having had the first English physician in this part of the country—Dr. Robinson, who located in Taos in 1806. Dr. Martin has been practicing in the state for over forty years. The Society is indeed honored to have such a man as its president. I will ask Dr. Miller (Clovis) to escort the President-Elect to the chair.

Amid the applause, President-Elect Martin was escorted to the platform, and then delivered his inaugural address.

The doctor deviated from the usual custom of having a prepared written address and, instead, gave an extemporaneous talk, in part as follows:

"My talk this morning will not be along medical lines. I have had a great many suggestions as to what the fraternity needs in New Mexico. As individuals I presume we all have insurance protective measures and as doctors we should have liability insurance. After investigation by our secretary, and correspondence with the various companies, we find we can get some high grade insurance companies who will take us on under group insurance at a cost of $17.50 per member, if we can get one hundred members, with limit from $5,000 to $15,000. I think it would be a very wise thing for the whole Society to take this insurance as a group.

"Two years ago, when our legislators and senators were in session at Santa Fe, we tried to obtain hearings on a Medical Arts Bill but could get nowhere—we could not even get the bill out of the committee. We had hearings before the senate committee and hearings before the house committee, but without avail. One member, who was very much opposed to it, said that he did not believe in doctors anyway, that his wife had been injured and he had three doctors attend her, but

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**Archives of Dermatology and Syphilology:**
"In this third edition Sutton has succeeded in presenting an eminently complete reference book on dermatology and syphiology. The completeness of the work is reflected in several ways: practically all recognized dermatoses are discussed—some briefly, others at length—according to their relative importance and frequency. The author has evident'y spared no effort to present a thoroughly and eminently authoritative book destined to be of great value not only to the student and practitioner, but also to the research worker and writer."

**Journal of Amer. Med. Ass'n.**
"Dr. Sutton is one of the most indefatigable of American dermatologists; a treatise on dermatology naturally comes as a sequence of his labors. He has been an independent investigator, but his work has been constructive and not iconoclastic. As would be expected, therefore, his treatise, whi'e showing his independence of view, is along conservatve lines, and is free from the unpardonable sin in a textbook of being controversial. This work is well done and it is highly recommended for study to the practitioner who would obtain a grasp of the subject of dermatology as a whole, as distinguished from a smatterinv knowledge of a few dermotoses."

**British Journal of Dermatology:**
"Dr. Sutton's book is so well known and appreciated that nothing is wanting to recommend this new edition to those familiar with the earlier works. The illustrations are so numerous as to entitle the work to be classified as an atlas of skin diseases; in fact, there are few atlasses which contain so complete a pictorial record of the whole field of dermatology. The author and publishers are to be congratulated not only on having secured such a large collection but on the excellence of their reproduction."

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none of them ever did her any good, so he was opposed to the profession and to any bill for it. We met opposition like this on one hand, and, on the other hand, those who might have been favorable and helped us, said, when approached, that they did not know anything about the bill, but if Dr. So-an-so will say it is all right, I will vote for it.' Drs. Joyner, Brown, Luckett and I spent almost a day and a night getting out telegrams requesting the doctors to get in touch with their members, and yet a lot of them would not even take the trouble to send in a telegram. If we want to get any constructive legislation, anything that will define what the proctice of medicine means, any substantial base upon which a judge can render a decision in our favor, we have to tune up and make our laws better. And if we want to get any legislation at all, we will have to go to the legislature at the beginning of the session and not wait until towards the close of the session, when politics is always played and not much accomplished. We have simply got to put our shoulders to the wheel, or we will be blown up.

"Last year at our annual meeting, Dr. Elliott started what I think is the most valuable piece of literature that we have ever had at a Society meeting. He traced the medical history of this state from its beginning up to a few years ago, but his information was not complete. As a fraternity of professional men, we should take pride in the history of our organization. We have a lot of men who came to New Mexico years ago—men who did not come on Pullman trains, or in Buicks or Packards or other machines—but some of them came on jackasses and some on mustangs.- After the fine data Dr. Elliott has collected, we should have someone try to trace back some of these old physicians who represented this Society in the days gone by, who, many times when they probably did not have a dollar in the world, yet went out to the American Medical Association and kept us on the map. We should keep a record of the history of this Society and I hope the Society will have a Historical Committee to gather this data now. The longer things of this kind are deferred, the harder it is to obtain accurate records.

"The next point I want to take up is in regard to the State Laboratory. It is a wonderful institution. I understand the Laboratory made between 35,000 and 37,000 examinations during the past year. It is very crowded for quarters and also for funds. The enlargement of the laboratory is absolutely essential if it is to continue to do this work for us and which we are doing for the people. Whether or not we can get additional space at the University of New Mexico, where the laboratory is now located, I do not know, but we, as members of the fraternity, must get back of this laboratory and keep it alive. We are all paying revenue to the state, paying taxes, and if we cannot get more room here at the University, let us make the state provide us ample quarters in the new building to be erected at Santa Fe. I do not know how Albuquerque will feel about that, but if you want it kept here, let's make it a better and bigger laboratory. If you do not want it, let's take it up at the capitol and make the state furnish us with adequate quarters.

"Another thing I have been asked to speak about is public nursing. The public nursing system, as we have it today, is absolutely paying all attention to the maternity and paternal cases. We are not looking after the general health and general welfare of our community, as we should be doing, instead of specializing on certain kinds of work. However, I understand that this work is being done under the Sheppard-Towner fund allotment and it is a wonderful work. The appropriation for this work will run out soon and we will need funds to continue it, but we also need more general nurses, and that is the point I want to emphasize—that we need more nurses for general nursing all over the state.

"I want to thank you for electing me President of the Society and I will try to serve you to the best of my ability."

The first scientific paper of the morning was read by Dr. F. H. Crail, of East Las Vegas, who gave an interesting account and description of conditions and opportunities for post-graduate studies in Vienna, where he spent considerable time last summer. The Doctor stated that, from what he saw, the general methods of procedure in surgery are much alike in the various countries of continental Europe, so that, if one became familiar with clinics of Vienna, for example, he would have a pretty good idea of how the profession functions throughout most of Europe.

Discussion was participated in by Dr. O. S. Fowler (Denver), who stressed the point that, in his opinion, too much time is being given to surgical technic and too little to surgical physiology.

Dr. C. W. Thompson, Pueblo, Colorado, read a very interesting paper on the subject 'The Contributions of Psychiatry to Medicine," which will be published in an early issue of SOUTHWESTERN MEDICINE.

Dr. O. S. Fowler, Denver, Colorado, followed with a paper entitled "Tongues and Edema," in which he recalled the fact that the tongue is an index or barometer of the patient's physical condition. Illustrating his talk with lantern slides, Dr. Fowler emphasized the importance of a thorough diagnosis of cases before operation.

Discussion was participated in by Drs. Crum Epler, Pueblo, Colo., who complimented Dr. Fowler upon his paper and voiced his concurrence in the method of giving unlimited amounts of fluids to clear edemas of kidney origin. Dr. G. V. Brindley, Temple, Texas, also expressed his approval of Dr. Fowler's paper, stating that observation is one of the most important points the physician must learn. In closing the discussion Dr. Fowler stated that, in his opinion, surgery is being put upon too high a pedestal and given undue importance to-day: that to keep well, a person weighing around 180 pounds should drink at least fifteen glasses of liquids a day; for one weighing around 115 or 120 pounds, the amount of fluids should be from nine to ten glasses per day, part of it fruit acids, such as oranges, lemons, etc.

Adjournment for luncheon followed the discussion of Dr. Fowler's paper.

The first paper of the afternoon session was that of Dr. G. V. Brindley, Temple, Texas, on "Cancer of the Rectum," in which the fact was brought out that one patient out of every 545 admitted for general examination, has a cancer of the rectum. The Doctor explained that carcinoma of the large bowel has a predeliction to three of its separate segments; that the rectum is the part most frequently involved, the sigmoid is next and the cecum, with the adjacent ascending colon, comes third. Ninety per cent of all cancers of the large bowel are in these three parts, with approximately sixty per cent or more in the rectum. Treatment of cancer of the rectum can be considered from the standpoint of curability and palliation, radical excision being the only thing that gives much prospect of a permanent cure' that, by the use of cautery, a radical excision of the malignant rectum can be performed with ease and dispatch. Colostomy, radium and x-ray are the chief agencies of palliation.

In opening the discussion, Dr. Sanford Withers, Denver, Colo., advised physicians to be suspicious of, and expect, a cancer of the rectum every time a patient complains of passing blood. He advocat-

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ed colostomy as the most essential part of treatment of cancer of the rectum, stating that he believed it helped to allow one to determine whether the growth is operable or inoperable. He cited a report of 58 cases of inoperatble cancer treated by x-ray and radium which he made a few years ago, 32 of which are still living more than two years since starting treatment, 14 without recurrence of malignancy, all living and well.

Dr. Crum Epler, Pueblo, Colo., stated that in his opinion, the only treatment for cancer is the knife. "When patients have procrastinated so long as to be inoperable (but it is a matter of judgment on the part of the surgeon as to whether these cases are operable or not), it is better to refer them to a competent radiologist than to attempt to operate."

Dr. Brindley, in closing the discussion, stated that he is a great believer in radio therapy and hoped that x-ray and radium would eventually cure radical cancer; that he believes it cures permanently in a very few cases, but that a period of two years is an insufficient length of time to permit of the use of the word "cure" in connection with these cases.

Dr. Wilburn Smith, Los Angeles, Cal., presented a paper entitled "The Superior Mesenteric Thrombosis," stating that "this condition is not common, for, since the first description in 1847, about 500 cases have been described, with only 35 of these surviving the attack, whether operated or not, thus giving a mortality of 93 per cent. Occlusion of the mesenteric artery is usually from an embolus, followed by thrombosis. In the mesenteric vein it is thrombosis from the start. The lesions produced are variable from slight congestion to marked ulceration and extensive gangrene. (1) The occlusion may be followed by collateral circulation either of a temporary or permanent nature. (2) The occlusion may be followed by cessation of function yet the life of the intestine be intact. (3) It may be an infarct with death of a variable amount of the small intestine."

In discussing this paper, Dr. O. S. Fowler (Denver, Colo.) mentioned food poisoning in relation to mesenteric thrombosis, stating that he had seen three cases following shell-fish poisoning, and, in his opinion, shell fish or sea fish should not be eaten in the middle of the continent.

Dr. F. H. Crail, East Las Vegas, expressed his appreciation of Dr. Smith's paper and cited two cases of mesenteric thrombosis under his care, both of which died. In the first case, the patient was sick with "la grippe," followed by sinus infection, and then taken suddenly ill with acute abdominal pain and vomiting. The other case, an elderly man, had had a regurgitant murmur for many years and was taken sick, after eating a light supper, with what was thought to be acute indigestion. At the end of the third day, when Dr. Crail first saw him he was vomiting and having very light bowel movements but with dark, ill-smelling material coming with every enema; temperature subnormal. Operation was performed but patient died within two days.

In closing the discussion, Dr. Smith stated he wanted to emphasize the remarks made by Dr. Fowler in regard to fish poisoning, which was the cause of many cases.

Dr. A. J. Markley, Denver, Colo., read a paper entitled "The significance of Certain Eruptive Disorders of the Skin, with Special Reference to the Toxic Erythemas, Purpura, Urticaria, Eczema and Psoriasis," describing and commenting on the different conditions, in conclusion stating: "The problem for solution when confronted by any eruptive dermatosis is simply this: Is this a primary disease of the skin which can be dealt with by local measures, or is it merely a symptom, and if so, what? The successful solution of that problem will mean the comfort, the peace of mind, and often the well-being of many patients."

Two cases were presented for examination by Dr. Markley, one of which he described as a skin disorder, definitely and wholly systemic, more or less associated to chronic infections. The other, a case of round dry scales or crusts, was described as possibly due to a nervous disorder, causing functional disturbance in the alimentary tract.

Dr. Crum Epler, Pueblo, Colo., in an extremely interesting paper entitled "Some of the Symptomatic Disturbances in Other Organs that are referable to the Gall-Bladder," brought out the following points: (1) Cholecystitis is a very common disease, manifested by symptoms in other organs, especially the stomach. (2) A long and persistent gastric syndrome, especially if free from acute pain associated with the taking of food, warrants a thorough gall-bladder investigation. (3) The Ewald meal, the duodenal tube and the cholecystogram are indispensable methods of diagnosis. (4) The history is paramount and, together with physical examination and other laboratory methods, is of the greatest importance.

In discussing this paper, Dr. G. V. Brindley (Temple, Texas), reported that, after an analysis of the histories of a series of 200 gall-bladder cases, he had come to the conclusion the gall-bladder disease is a sequence to some other infection and that by going far back into the history, it will help somewhat to cinch the diagnosis.

Dr. O. S. Fowler (Denver, Colo.), expressed the opinion that pain in the kidney which will be severe while the kidney is out of position, would be alleviated when the patient lies down on his back, and that many things which give pretty complete obstruction of the kidney, can be relieved by change of posture of the individual. He also stressed the importance of careful histories in these cases.

In closing the discussion, Dr. Epler told of cases of renal colic, in which patients had been advised to lay a chair down on the floor, lie with head on the chair and shoulders on the floor and roll around, in an effort to get relief. In many of these particular types, relief is afforded in this manner. These displaced kidneys cause pain until the patient moves into such a position that it gets the kidney back to the place it belongs.

Adjournment followed the discussion of Dr. Epler's paper.

FRIDAY, MAY 11 1928.

At a meeting of the House of Delegates, called to order by the president, Dr. T. P. Martin (Taos), at 9 a. m., the following members were present:

Bernalillo County: Drs. C. Mulky, L. B. Cohenour, E. C. Matthews, J. R. Van Atta, (all Albuquerque).

Chaves: Drs. R. L. Bradley; H. A. Ingalls; (both Roswell).

Colfax: Dr. C. B. Elliott (Raton).

Dona Ana: Dr. Dwight Allison (Las Cruces).

Eddy: Dr. M. B. Culpepper, (Carlsbad).

San Miguel: Dr. H. W. Gibbs, (Las Vegas).

Santa Fe: Dr. Robert Brown, (Santa Fe).

Union: Dr. J. P. Powell.

Minutes of the meeting held May 10th were read and approved.

The secretary, Dr. Cohenour, read a telegram from Dr. F. D. Vickers expressing regret at his inability to attend on account of illness in his family.

The secretary read a letter from the Woman's Auxiliary to the Bernalillo County Medical Society, to the effect that, at a recent meeting of the Auxiliary, it was decided to make the Society a state-

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wide organization, thus rendering eligible to membership the wives of the members of the State Society from all counties where there is no local organization of the Auxiliary, and requesting approval of the House of Delegates to this change. The action was approved.

Dr. S. L. Burton (Albuquerque) suggested that a committee be appointed to revise the Constitution and By-Laws of the Society, and also proposed regulations covering the term of appointment of members of the State Examining Board.

Discussion was entered into by Drs. W. T. Joyner (Roswell) and Dwight Allison (Las Cruces), who stated that, several years ago, the matter of revising the Constitution and By-Laws had been brought up in connection with model forms sent out by the American Medical Association, which it wished State Societies to adopt. However, these were not deemed suitable for the Society. Dr. Joyner stated that, as far as membership on the State Examining Board was concerned, the Society has no authority, such appointments being made by the Governor.

Dr. R. L. Bradley (Roswell) made motion that the Chair appoint a committee of three, to look over the By-Laws and make recommendation for such changes as might be deemed advisable, to report at the next annual meeting. This was seconded and carried, the President appointing as such committee: Drs. Dwight Allison (Las Cruces); Robert Brown, (Santa Fe) and E. E. Royer (Albuquerque).

Dr. Dwight Allison (Las Cruces) requested that announcement be made that members who could suggest changes in the By-Laws make same to the Committee.

Dr. R. L. Bradley (Roswell) spoke on the illegal practice of medicine being carried on in his county, and methods to eradicate this evil were discussed by Drs. Joyner and Powell, the most fesaible of which seemed to be the annual registration of licensed physicians by the State.

No definite action was taken and the meeting adjourned at 9:25 a. m.

### Scientific Session.

The first paper of the morning session, read by Dr. H. W. Snyder, Denver, Colo., was entitled "Diagnosis and Treatment of Marie-Strumpell Osteo-Arthritis," illustrated by lantern slides. The Doctor stated that "this is a chronic progressive disease of the spine, beginning with painful stiffness and terminating in complete rigidity and a variable degree of deformity, chiefly affecting men between twenty and forty years of age. Today we recognize three types of spondylitis deformans: (1) A manifestation of general arthritis; (2) Chronic hypertrophic arthritis of the spine accompanied at times by arthritis of the shoulders and hips; (3) A primary infection of the spine alone without marked involvement of the other joints."

Dr. Snyder's paper was in connection with the second type.

Dr. James F. Percy, Los Angeles, Cal., in discussing the paper, cited the case of a woman about thirty years of age, who had been treated by him


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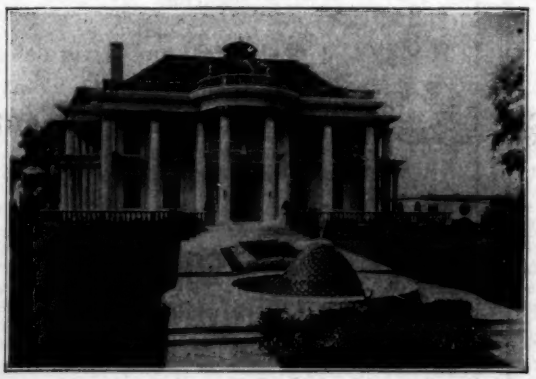

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about a year and a half ago for advanced cancer of the breast, though not yet broken down, who also had this kind of miserable arthritis. The Doctor stated that he was not interested in the arthritis side of the case and intended to turn it over to someone else for that after she got through with the cancer operation, but she got well of the arthritis, and yet she had the lumping of the spine about which Dr. Snyder spoke. In some of these cases much relief is obtained by removing the colon. Dr. Smith, in Los Angeles, has done much work along this line.

Questions were asked Dr. Snyder in regard to the autogenous vaccines used in the treatment of these cases, and, in closing the discussion, Dr. Snyder stated that he has the laboratory do the work and personally knew hardly anything about it.

Dr. H. A. Miller (Clovis) in a paper entitled "A Simple Technic for the Estimation of Blood Urea," cited a short, easy method for obtaining a blood retention index, stating that, 'We make no claim for originality in this method, but use the Hench-Aldrich technic, or mercury-combining power of the blood serum after being deproteinized. The only objection to this method is the comparatively large amount of blood necessary for the test, viz., 8 to 10 c.c."

Dr. O. S. Fowler (Denver), discussed the paper, voicing his belief that in 50 or 75 years we will not only know all about the chemistry of the blood, but also the chemistry of the cells.

Dr. Sanford Withers, Denver, delivered an extemporaneous address on the subject "Principles of the Treatment of Cancer." The talk was illustrated with lantern slides, Dr. Withers stressing the fact that many cases of cancer which it would be impossible to cure by operation, can be cured by the proper use of x-ray and radium. He defined cancer as a group of body cells which fail to cease growing and stated that ten of every one hundred men and twenty of every one hundred women die of cancer, though cancer in the human being has not been found to be hereditary, as is generally supposed. He quoted records to prove that a person whose parents had died of cancer was only three-fourths as liable to have cancer as any other person and that insurance companies do not now ask the applicant for insurance whether his parents have had cancer. Dr. Withers advanced a complete examination, explaining that frequently cancer occurs simultaneously in two or more organs of the body. Pre-operative use of the x-ray was recommended as being of immense value in limiting the rucurrence of cancer, and, frequently, use of the x-ray before operating changes the case from one of difficult operability to one of considerable ease.

Adjournment for luncheon followed Dr. Withers' address.

Dr. James F. Percy, Los Angeles, Cal., was the first speaker of the afternoon session and his brilliant discourse on "Cautery Surgery in Carcinoma above the Clavicle", which was illustrated by a number of slides, elicited considerable discussion and comment.

In discussing the addresses of Dr. Withers and Dr. Percy, Dr. Crum Epler, (Pueblo, Colo.,) said that he took exception to the statements made relative to the "clinical cure" and that in his opinion the word "cure" should be left out. However, this kind of work is very essential. "As far

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as Dr. Percy's claims for his cautery are concerned," Dr. Epler continued, "I desire to give him credit insofar as my ability to use is concerned. I do not happen to have attained such wonderful results, but neither have I attained the skill that he has; nevertheless, I can say that it is a very wonderful instrument in proper hands. I feel that this is a matter of salesmanship and the general practitioner is presumed to be the clearing house for the specialist, and if the specialist is as good a salesman as he is a specialist, there will be fewer people dying, as they will be operated earlier.

Dr. M. K. Wylder (Albuquerque) expressed his appreciation at hearing the views of two men, both experts, tackling the same difficult problem from entirely different angles. He referred to the wonderful work done by Maud Slye and advocated the keeping of records, by the government, of families wherein cancer cases developed, in order to determine definitely whether or not heredity plays any part in the transmission of this disease.

Dr. O. S. Fowler (Denver) stated that it always seemed to him that, while we are dealing with the treatment of a localized condition in the hope of destroying the entire area of involvement, a better approach and what he believes will be the ultimate treatment of cancer, is through systemic methods and that method will offer the greatest chance of cure. He cited a case that involved the entire intestines. The family were anxious and desirous that operation be performed, but, after cleaning out the pelvis, it was noticed that the intestine was still studded with the growth. The use of lead was suggested, but the doctor was away at that time so the treatments were carried out by his assistants. "The lead was administered but, unfortunately, the woman developed lead poisoning, of which she died. The men tell me that lead poisoning is the great danger from this treatment."

Dr. Withers, in closing, stated that he wished to emphasize Dr. Fowler's remarks—that he believed the great advance to be made in the treatment of advanced cancer would be through some systemic method, whether it be in the form of a vaccine, antiserum, or whether it be some specific protein or what not.

Dr. Percy, in closing, stated that it is only by looking at a situation from two entirely different viewpoints that the truth can be ascertained. He used a quotation of an old English surgeon that "everybody would die of cancer if they lived long enough," as a probable explanation of the noted increase of cancer.

Dr. George Piness, Los Angeles, Cal., the next speaker, gave an extremely interesting talk on "The Problem of Allergic Manifestations in Infancy and Childhood."

In the discussion, Dr. M. K. Wylder (Albuquerque) stated that he had enjoyed the Doctor's lecture very much and had gained some points entirely new to him, especially the way of testing the sensitiveness of young babies by the transfer method.

Dr. W. A. Gekler (Albuquerque) asked in regard to the allergic type of individual, who, as he recovers from tuberculosis, develops hay-fever, stating that, as a rule, he found those patients who developed hay-fever were over their tuberculosis.

Dr. Piness, in closing the discussion, stated that he had always found that any tuberculous patient would be free of asthma as long as he was running a temperature, and cited several cases to bring out this point.


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Dr. Piness was followed by Dr. Victor E. Chesky, Halstead, Kansas, who spoke on "The Cardiac Manifestations of Goitre." The Doctor brought out the following points: (1) "Cardiac failure in goiter patients is not due to damaging action of the toxin on cardiac muscle, but is due to over-stimulation of a heart weakened by previous cardiac disease. (2) There has been no definite cardiac pathology demonstrated as being due to thyroid toxemia. (3) The various forms of colloid goiters produce no cardiac symptoms until cellular hyperplasia takes place within them. (4) Undamaged hearts bear thyroid toxemia exceeding well. (5) There is a type of toxic thyroid, seen usually in the last few decades of life, in which the cardiac symptoms completely overshadow the toxic and these are frequently erroneously treated as purely cardiac patients, without results. When these patients are subjected to thyroidectomy their cardiac recovery is complete and permanent."

In the discussion, Dr. Crum Epler (Pueblo) stated that his experience with these cases had not proven digitalis to be of any value. He recommended, in preoperative cases, rest in bed, plenty of food and freedom from friends, leaving them to themselves.

Dr. M. K. Wylder (Albuquerque) cited the work of a friend of his in St. Louis, in connection with the treatment of goiter cases, stating that he was keeping them absolutely quiet, allowed no visitors and insisted on the nurses giving the patients a glassful of water every hour they were awake. The only way they could get out of it was by being asleep. The Doctor claimed that they would stand operation much better after this treatment.

Dr. James F. Percy (Los Angeles) asked if, in digitalizing these patients, any sudden deaths had resulted.

Dr. George Piness (Los Angeles) asked, in cases of dehydration by glucose or water, whether bromide is of value where digitalis does not bring the action down.

Dr. Chesky, in closing, remarked that he had all the respect in the world for digitalis; that we know it is a poison and that it has to be carefully handled, and that he only gave it in cases where there was decompensation, where—there was heart failure. He endeavors to figure out the amount required and gives it in divided doses, so that it can be stopped completely if any untoward symptoms develop. He further stated that he had seen sudden deaths follow the administration of digitalis and that he believed it should be used with great care and in such a way that the full required amount is not given at once. The Doctor agreed that water was extremely valuable in these cases and stated that bromides were occasionally used and of value to the nervous types. Luminal is advantageous in this connection.

Adjournment followed the discussion of Dr. Chesky's paper.

(Continued in next issue)


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